

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 640 837

Injection pump  
Pump designation : PE12P120A320LS7807  
EP type number : 0 412 620 806  
Governor  
Governor design. : RQ400/1065PA1024  
Governor no. : 0 421 801 634

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 485.0  
Rated speed : 2130

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1065

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0  
Rack travel in mm : 4.8...5.4  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2

Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1065  
Aneroid pressure h: 1000  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90  
Speed rpm : 1110...1125  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

Testing:

Speed rpm : 300  
Minimum rack travel: 6.90  
Speed rpm : 400  
Rack travel in mm : 4.80...5.40  
Rack travel in mm : 2.00  
Speed rpm : 460...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.80...11.10

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 320 (340)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 205.0...209.0  
1000 s: (202.0...212.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)

Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1110...1125

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

APPLICATION

Rail car



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 q 1  
 Edition : 20.03.92  
 Replaces : 02.92  
 Test oil : ISO-4113  
 Combination no. : D 402 646 940  
 Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/950PA971-7  
 Governor no. : 0 421 801 580

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/ : 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 182.0...184.0

1000 : (179.0...187.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.10  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.60

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 11.80...12.00  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.80  
4th pressure hPa : 1150  
Rack travel in m: 12.90...13.10  
5th pressure hPa : -  
Rack travel in m: 10.30...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 203.0...206.0  
1000 s: (200.0...209.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 45.0...75.0  
1000 s: (41.0...79.0)  
Rack travel in mm : 10.30...10.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 5  
Edition : 27.03.92  
Replaces : 09.91  
Test oil : ISO-4113

Combination no. : 0 402 646 955

Injection pump  
Pump designation : PE6P120A320LS7834-1  
EP type number : 0 412 626 857  
Governor  
Governor design. : RQV350...1050PA866  
-13  
Governor no. : 0 421 813 954

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.60...14.80  
Del.quantity cm3/ : 22.2...22.4  
100 s: (21.9...22.7)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.1...5.7  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.40...1.60  
4th speed rpm : 1200  
travel mm : 8.50...9.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1130  
Rack travel in mm : 16.50...18.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 222.0...224.0  
1000 : (219.0...227.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 13.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 63...71

Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

#### TORQUE CONTROL

2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 600  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1350  
Rack travel in m: 14.70...14.90 \*  
4th pressure hPa : -  
Rack travel in m: 10.00...10.30

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 241.0...245.0  
1000 s: (238.0...248.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 175.0...179.0 \*  
1000 s: (172.0...182.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

\* = Set at reduced-delivery stop.

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 7  
Edition : 27.03.92  
Replaces : 10.91  
Test oil : ISO-4113

Combination no. : 0 402 646 961

Injection pump  
Pump designation : PE6P120A320LS7834-1  
EP type number : 0 412 626 857  
Governor  
Governor design. : RQV350...950PA866-14  
Governor no. : 0 421 813 959

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.55)

Rack travel in mm : 20.00...21.00

Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm3/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.80

2nd speed rpm : 424

travel mm : 2.30...2.80

3rd speed rpm : 700

travel mm : 4.10...4.60

4th speed rpm : 1008

travel mm : 7.90...8.40

5th speed rpm : 1220

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 985

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 111...119

Testing:

1st rack travel in: 13.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 63...71

Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.30...13.50

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 550  
Rack travel in m: 12.30...12.50  
3rd pressure hPa : 1300  
Rack travel in m: 13.70...13.90  
4th pressure hPa : -  
Rack travel in m: 9.90...10.20

#### START CUT-OUT

Speed 1/min : 270 (290)

A08

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 228.0...231.0  
1000 s: (225.0...234.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 169.0...173.0 \*  
1000 s: (166.0...176.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 o 8  
 Edition : 27.03.92  
 Replaces : 01.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 965  
 Injection pump  
 Pump designation : PE6P120A320LS7834-1  
 EP type number : 0 412 626 857  
 Governor  
 Governor design. : RQV350...1050PA866  
 -19  
 Governor no. : 0 421 813 979

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA, Euro 1

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.55)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del. quantity cm<sup>3</sup>/ : 20.7...20.9  
 100 s: (20.4...21.2)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80  
 2nd speed rpm : 570  
 travel mm : 3.30...3.80  
 3rd speed rpm : 900  
 travel mm : 5.40...5.90  
 4th speed rpm : 1107  
 travel mm : 7.80...8.30  
 5th speed rpm : 1204  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 207.0...209.0  
1000 : (204.0...212.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.40...6.00

CONSTANT REGULATION  
Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1350  
Rack travel in m: 14.40...14.60  
4th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 225.0...228.0  
1000 s: (222.0...231.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 226.0...230.0  
1000 s: (223.0...233.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 169.0...173.0 \*  
1000 s: (166.0...176.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* = Set at reduced-delivery stop.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 r 5  
 Edition : 27.03.92  
 Replaces : 12.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 966  
 Injection pump  
 Pump designation : PE6P120A320LS7836-1  
 EP type number : 0 412 626 860  
 Governor  
 Governor design. : RQV350...1050PA866  
 -20  
 Governor no. : 0 421 813 980  
 Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM401 LA, Euro 1  
 1st version kW : 200.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.55)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 12.40...12.60  
 Del.quantity cm3/ : 18.2...18.4  
 100 s: (17.9...18.7)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...6.2  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80  
 2nd speed rpm : 570  
 travel mm : 3.30...3.80  
 3rd speed rpm : 900  
 travel mm : 5.40...5.90  
 4th speed rpm : 1107  
 travel mm : 7.80...8.30  
 5th speed rpm : 1204  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 800  
Del.quantity : 182.0...184.0  
1000 : (179.0...187.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 115...123

Testing:

1st rack travel in: 12.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 63...71

Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.60

Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 1000  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : -  
Rack travel in m: 10.50...10.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 201.0...204.0  
1000 s: (198.0...207.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 149.0...153.0 \*  
1000 s: (146.0...157.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 646 968

Injection pump  
Pump designation : PE6P120A320RS7248  
EP type number : 0 412 626 861  
Governor  
Governor design. : RQV275...1150PA986  
Governor no. : 0 421 813 920

Customer-spec. information  
Customer : DAF

Engine : RS 222 L

1st version kW : 222.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 120...140

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.7...12.7  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.20...1.60

2nd speed rpm : 315

travel mm : 1.80...2.20

3rd speed rpm : 1205

travel mm : 8.10...8.50

4th speed rpm : 1340

travel mm : 9.70...9.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1315

Rack travel in mm : 10.90...13.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 184.0...186.0  
1000 : (181.0...189.0)  
Spread cm3 : 5.00  
1000 : (9.00)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 11.20  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

### LOW IDLE 1

Control lever  
position degrees: 79...87

#### Testing:

Speed rpm : 175  
Minimum rack travel: 6.30  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

### CONSTANT REGULATION

Speed rpm : 315...365

### Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.20...12.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 420  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 240  
Rack travel in m: 10.30...10.50

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (117.0...125.0)

### BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1180...1190

### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
 Edition : 27.03.92  
 Replaces : 02.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 969  
 Injection pump  
 Pump designation : PE6P120A320RS7248Z  
 EP type number : 0 412 626 862  
 Governor  
 Governor design. : RQV275...1150PA986  
 Governor no. : 0 421 813 920

Customer spec. information  
 Customer : DAF

Engine : RS 200 L

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 120...140

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 14.00...15.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 10.8...11.8

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 1.20...1.60

2nd speed rpm : 315  
 travel mm : 1.80...2.20

3rd speed rpm : 1205  
 travel mm : 8.10...8.50

4th speed rpm : 1340  
 travel mm : 9.70...9.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1335

Rack travel in mm : 9.00...11.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000  
Del.quantity : 164.0...166.0  
1000 : (161.0...169.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 175  
Minimum rack trave: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 340  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 200  
Rack travel in m: 9.60...9.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm3/ : 115.0...117.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

1st version  
1mm rack travel Less than

full load rack tr: 10.30  
Speed rpm : 1180...1190

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 646 970

Injection pump  
Pump designation : PE6P120A32ORS7248Y  
EP type number : 0 412 626 863  
Governor  
Governor design. : RQV275...1150PA986  
Governor no. : 0 421 813 920

Customer spec. information  
Customer : DAF

Engine : RS 180 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 120...140

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 10.2...11.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm<sup>3</sup>/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.20...1.60

2nd speed rpm : 315  
travel mm : 1.80...2.20

3rd speed rpm : 1205  
travel mm : 8.10...8.50

4th speed rpm : 1340  
travel mm : 9.70...9.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 145.5...147.5  
1000 : (142.5...150.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1180...1190  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 175  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 315...365

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 250  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 140  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 107.0...109.0  
1000 s: (104.0...112.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1180...1190

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 971  
  
Injection pump  
Pump designation : PE6P120A320RS7218Z  
EP type number : 0 412 626 847  
Governor  
Governor design. : RQV275...1000PA939-2  
Governor no. : 0 421 813 986

Customer-spec. information  
Customer : DAF

Engine : WS 242 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 419 992 198  
  
Inlet press., bar : 1.50  
  
Overflow  
quantity min. 1/h: 95...115  
  
Test nozzle holder  
assembly : 1 688 901 105  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
                  : (5.25...5.45)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 13.5...14.5  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850  
Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 20.5...20.7  
100 s: (20.2...21.0)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.1...6.3  
Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 7.70...8.20  
2nd speed rpm : 275  
travel mm : 1.10...1.60  
3rd speed rpm : 380  
travel mm : 2.40...2.90  
4th speed rpm : 675  
travel mm : 4.20...4.70  
5th speed rpm : 1310  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1130  
Rack travel in mm : 12.60...15.20

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 205.0...207.0  
1000 : (202.0...210.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 115...123

### Testing:

1st rack travel in: 12.80  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

## LOW IDLE 1

Control lever  
position degrees: 78...86

### Testing:

Speed rpm : 175  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

## CONSTANT REGULATION

Speed rpm : 300...350

## Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 600

### 1st pressure hPa : -

Rack travel in m: 11.70...11.90

### 2nd pressure hPa : 420

Rack travel in m: 13.30...13.40

### 3rd pressure hPa : 260

Rack travel in m: 12.20...12.40

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 147.0...149.0  
1000 s: (144.0...152.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 1040...1050

## LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.90...5.10

## Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 972  
  
Injection pump  
Pump designation : PE6P120A320RS7218  
EP type number : 0 412 626 839  
Governor  
Governor design. : RQV275...1000PA939-2  
Governor no. : 0 421 813 986

Customer-spec. information  
Customer : DAF

Engine : WS 268 L

1st version kW : 268.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 95...115

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
(5.25...5.45)  
Rack travel in mm : 14.30...15.30  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 14.5...15.5  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.80...14.90

Del. quantity cm<sup>3</sup>/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.1...6.3  
Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
travel mm : 7.70...8.20  
2nd speed rpm : 275  
travel mm : 1.10...1.60  
3rd speed rpm : 380  
travel mm : 2.40...2.90  
4th speed rpm : 675  
travel mm : 4.20...4.70  
5th speed rpm : 1310  
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION  
Control-lever position

Degree: -1  
Speed rpm : 1125  
Rack travel in mm : 13.60...16.20  
  
FULL LOAD DELIV. AT FULL LOAD STOP  
  
1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 230.0...232.0  
1000 : (227.0...235.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 175  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 300...350

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...14.90

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 490  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 280  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 158.0...160.0  
1000 s: (155.0...163.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1040...1050

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 973  
  
Injection pump  
Pump designation : PE6P120A32ORS7218Z  
EP type number : 0 412 626 847  
Governor  
Governor design. : RQ275/1000PA936-2  
Governor no. : 0 421 801 633

Customer-spec. information  
Customer : DAF

Engine : WS 242 L

1st version kW : 268.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
: (5.25...5.45)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 13.5...14.55  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.0...6.2  
Del.quantity cm3/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 205.0...207.0  
1000 : (202.0...210.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

Testing:

Speed rpm : 175  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 1000  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 420  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 260  
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 147.0...149.0  
1000 s: (144.0...152.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.10

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 646 974

Injection pump  
Pump designation : PE6Pi20A320RS7218  
EP type number : 0 412 626 839  
Governor  
Governor design. : RQ275/1000PA936-2  
Governor no. : 0 421 801 633

Customer-spec. information  
Customer : DAF

Engine : WS 268 L

1st version kW : 268.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 95...115

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
(5.25...5.45)  
Rack travel in mm : 14.50...15.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 14.5...15.5  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 6.1...6.3  
Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 230.0...232.0  
1000 : (227.0...235.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

## 1st version

### Setting point:

Speed rpm : 550  
Rack travel in mm : 16.0

### Testing:

1st rack travel in: 13.80  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

### Testing:

Speed rpm : 175  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 330...370

### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...14.90

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 490  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 280  
Rack travel in m: 12.80...13.00

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -

Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 158.0...160.0  
1000 s: (155.0...163.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1035...1050

### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.10

### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 984  
Injection pump  
Pump designation : PE6P120A32ORS7248  
EP type number : 0 412 626 861  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 222 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 638 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

A27

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.7...12.7  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 18.4...18.6

100 s: (18.1...18.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550  
Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 184.0...186.0  
1000 : (181.0...189.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 550  
Rack travel in mm : 16.0

Testing:

1st rack travel in: 11.20  
Speed rpm : 1175...1190  
2nd rack travel in: 4.00  
Speed rpm : 1255...1285  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 1150  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 420  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 240  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1175...1190

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 985

Injection pump  
Pump designation : PE6P120A320RS7248Z  
EP type number : 0 412 626 862  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 200 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 10.8...11.8  
Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 164.0...166.0

1000 : (161.0...169.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 10.30  
Speed rpm : 1175...1190  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 1150  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 340  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 200  
Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 115.0...117.0  
1000 s: (112.0...120.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1175...1190

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 986  
Injection pump  
Pump designation : PE6P120A320RS7248Y  
EP type number : 0 412 626 863  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 180 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 105  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 10.2...11.2  
Difference ° CS : 3.25...4.75

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 14.5...14.7  
100 s: (14.2...15.0)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 550  
Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 145.5...147.5  
1000 : (142.5...150.5)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 550  
Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.70  
Speed rpm : 1175...1190  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 1150  
Rack travel in m: 11.60...11.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 250  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 140  
Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 107.0...109.0  
1000 s: (104.0...113.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1175...1190

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI  
Edition : 03.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402-646 990  
Injection pump  
Pump designation : PE6P130A720RS7225  
EP type number : 0 412 636 817  
Governor  
Governor design. : RQV300...950PA975-2K  
Governor no. : 0 421 815 310

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8210.42.369

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 11.50...12.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 25.2...25.4

100 s: (24.9...25.7)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 4.1...4.5

Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995

travel mm : 8.40...8.60

2nd speed rpm : 300

travel mm : 1.00...1.40

3rd speed rpm : 500

travel mm : 3.30...3.90

4th speed rpm : 700

travel mm : 5.40...5.80

5th speed rpm : 1400

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 9.70...12.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 1000

Del.quantity : 252.0...254.0

1000 : (249.0...257.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 61...69

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.80  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

#### CONSTANT REGULATION

Speed rpm : 340...460

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 350  
Rack travel in m: 11.30...11.50  
3rd speed rpm : 700  
Rack travel in m: 11.90...12.00  
4th speed rpm : 550  
Rack travel in m: 11.70...11.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 950  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

#### Measurement

Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 600  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 500

Rack travel in m: 10.00...10.20

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 259.0...265.0  
1000 s: (259.0...265.0)  
Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 261.0...267.0  
1000 s: (258.0...270.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 186.0...188.0  
1000 s: (186.0...188.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...175.0  
1000 s: (141.0...179.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.10...4.50  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 991  
Injection pump  
Pump designation : PE6P120A320RS7218Y  
EP type number : 0 412 626 859  
Governor  
Governor design. : RQV275...1000PA939-2  
Governor no. : 0 421 813 986

Customer-spec. information  
Customer : DAF

Engine : WS 222 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
: (5.25...5.45)  
Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 13.2...14.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 19.5...19.7

100 s: (19.2...20.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 7.70...8.20

2nd speed rpm : 275

travel mm : 1.10...1.60

3rd speed rpm : 380

travel mm : 2.40...2.90

4th speed rpm : 675

travel mm : 4.20...4.70

5th speed rpm : 1310

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 11.40...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 195.0...197.0  
1000 : (192.0...200.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:

1st rack travel in: 12.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...350

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 230  
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 139.0...141.0  
1000 s: (136.0...144.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 e 3  
Edition : 27.03.92  
Replaces : 11.91  
Test oil : ISO-4113

Combination no. : 0 402 648 831

Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RQV350...1050PA842-7  
Governor no. : 0 421 813 874

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.50...14.70  
Del.quantity cm3/ : 21.2...21.4  
100 s: (20.9...21.7)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.7...5.9  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 0.80...1.20  
2nd speed rpm : 510  
travel mm : 3.60...4.10  
3rd speed rpm : 1100  
travel mm : 7.80...8.40  
4th speed rpm : 1270  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1125  
Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 750  
Del. quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 64...72

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.50...6.10

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 975  
Rack travel in m: 15.60...15.80

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.50...14.70

##### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 550  
Rack travel in m: 13.60...13.80  
3rd pressure hPa : 900  
Rack travel in m: 14.70...14.80

4th pressure hPa : 1250  
Rack travel in m: 15.50...15.70  
5th pressure hPa : -  
Rack travel in m: 11.60...11.80

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1250  
Speed rpm : 1050  
Del. quantity cm3/ : 221.0...224.0  
1000 s: (218.0...227.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1250  
Speed rpm : 900  
Del. quantity cm3/ : 233.0...237.0  
1000 s: (230.0...240.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1250  
Speed rpm : 1050  
Del. quantity cm3/ : 154.0...157.0  
1000 s: (151.0...160.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 147.0...149.0  
1000 s: (144.0...152.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
 Edition : 22.11.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 874  
 Injection pump  
 Pump designation : PE8P120A920/4LS7189  
 EP type number : 0 412 628 840  
 Governor  
 Governor design. : RQV200...950PA736-8  
 Governor no. : 0 421 813 815

Customer-spec. information  
 Customer : SCANIA

Engine : DSC14 10

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm3/ : 23.7...23.9  
 100 s: (23.4...24.2)  
 Spread cm3 : 0.7  
 100 s: (1.0)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 4.4...4.8  
 Del.quantity cm3/ : 1.2...1.6  
 100 s: (-)  
 Spread cm3 : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.40...1.80  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 995  
 travel mm : 7.70...7.90  
 5th speed rpm : 1115  
 travel mm : 9.20...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 237.0...239.0  
 1000 : (234.0...242.0)

Spread      cm<sup>3</sup> : 7.00  
             1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 12.00  
Speed      rpm : 990...1000  
2nd rack travel in: 4.00  
Speed      rpm : 1100...1130  
4th rack travel in: 1250  
Speed      rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 40...48

Testing:  
Speed      rpm : 100  
Minimum rack travel: 6.00  
Speed      rpm : 250  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed      rpm : 375...435

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed      rpm : 500  
Pressure    hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed      1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 525  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 320  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed      rpm : 500  
Del. quantity cm<sup>3</sup>/ : 142.0...146.0  
             1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed      rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...180.0  
             1000 s: (-)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed      rpm : 250  
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o  
Edition : 20.03.92  
Replaces : 24.01.92  
Test oil : ISO-4113

Combination no. : 0 402 648 893

Injection pump  
Pump designation : PE8P120A320LS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQ300/950PA971-2  
Governor no. : 0 421 801 548

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.50

Speed rpm : 300

Rack travel in mm : 5.90...6.50

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50

2nd speed rpm : 950

Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.70...14.90

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1000

Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 10.30...10.50

2nd pressure hPa : 650

Rack travel in m: 13.10...13.30

3rd pressure hPa : 8120

Rack travel in m: 14.20...14.40 \*

4th pressure hPa : -

Rack travel in m: 10.10...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 950

Del.quantity cm3/ : 216.0...219.0

1000 s: (213.0...222.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1500

Speed rpm : 750

Del.quantity cm3/ : 234.0...238.0

1000 s: (231.0...241.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 40.0...70.0

1000 s: (36.0...74.0)

Rack travel in mm : 10.10...10.40

Speed rpm : 100

Del.quantity cm3/ : 210...230 \*\*

1000 s: (200...240)

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

\*\* Value only applies to governor with no TAS



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 1  
Edition : 20.03.92  
Replaces : 01.92  
Test oil : ISO-4113

Combination no. : 0 402 648 894

Injection pump  
Pump designation : PE8P120A320LS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQV300...950PA797-18  
Governor no. : 0 421 813 886

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 638 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
(5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.10...14.30  
Del. quantity cm<sup>3</sup>/ : 22.5...22.7  
100 s: (22.2...23.0)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.5  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50  
2nd speed rpm : 567  
travel mm : 4.40...4.90  
3rd speed rpm : 780  
travel mm : 6.10...6.60  
4th speed rpm : 1009  
travel mm : 8.30...8.80  
5th speed rpm : 1092  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 980  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 225.0...227.0  
1000 : (222.0...230.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 122...130

Testing:

1st rack travel in: 12.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION

Speed rpm : 250...360

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 650  
Rack travel in m: 13.10...13.30

3rd pressure hPa : 1200

Rack travel in m: 14.20...14.40 \*

4th pressure hPa : -

Rack travel in m: 10.10...10.40

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 216.0...219.0  
1000 s: (213.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 2  
Edition : 20.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 648 895

Injection pump  
Pump designation : PE8P120A320LS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQ300/1050PA972-1  
Governor no. : 0 421 801 545

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.20...14.40  
Del. quantity cm<sup>3</sup>/ : 22.5...22.7  
100 s: (22.2...23.0)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.2...6.8  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 225.0...227.0  
1000 : (222.0...230.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00

Speed rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1350

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200

Minimum rack travel: 7.80

Speed rpm : 300

Rack travel in mm : 6.20...6.80

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50

2nd speed rpm : 1050

Rack travel in m: 14.00...14.20

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1000

Rack travel mm : 14.20...14.40

Measurement

Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 10.40...10.60

2nd pressure hPa : 650

Rack travel in m: 13.20...13.40

3rd pressure hPa : 1200

Rack travel in m: 14.30...14.40 \*

4th pressure hPa : -

Rack travel in m: 10.10...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 1050

Del.quantity cm3/ : 214.0...217.0

1000 s: (211.0...220.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1500

Speed rpm : 800

Del.quantity cm3/ : 232.0...236.0

1000 s: (229.0...239.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 30.0...70.0

1000 s: (26.0...74.0)

Rack travel in mm : 10.10...10.50

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 17,2 f  
Edition : 13.03.92  
Replaces : 07.91  
Test oil : ISO-4113

Combination no. : 0 402 648 912

Injection pump  
Pump designation : PE8P130A920/5LS7841  
EP type number : 0 412 638 803  
Governor  
Governor design. : RQV300...950PA994K  
Governor no. : 0 421 815 275

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8280.42.050

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 11.50...12.50

Firing order : 1- 8- 4- 3- 6- 5-  
7- 2

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.50...12.50  
& maximum rack tra: 19.9...20.1  
Difference ° CS : 1.25...2.75

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 21.8...22.0

100 s: (21.5...22.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 3.8...4.2  
Del.quantity cm3/ : 2.2...2.8  
100 s: (1.9...3.1)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
travel mm : 10.20...10.40  
2nd speed rpm : 300  
travel mm : 2.00...2.30  
3rd speed rpm : 700  
travel mm : 5.80...6.20  
4th speed rpm : 1200  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1000  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950  
Aneroid pressure h: 900  
Del.quantity : 218.0...220.0  
1000 : (215.0...223.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 9.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.50  
Speed rpm : 300  
Rack travel in mm : 3.90...4.10

#### CONSTANT REGULATION

Speed rpm : 310...440

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 400  
Rack travel in m: 9.90...10.10  
3rd speed rpm : 550  
Rack travel in m: 10.10...10.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 10.50...10.60

#### Measurement

Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 300

Rack travel in m: 9.90...10.00  
3rd pressure hPa : 230  
Rack travel in m: 8.80...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...147.0  
1000 s: (140.5...150.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.80...4.20  
Del.quantity cm3/ : 22.0...28.0  
1000 s: (19.0...31.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 17,2 f1  
 Edition : 20.03.92  
 Replaces : 07.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 913  
 Injection pump  
 Pump designation : PE8P130A920/5LS7841  
 EP type number : 0 412 638 803  
 Governor  
 Governor design. : RQV300...950PA994-1K  
 Governor no. : 0 421 815 276

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.350 SPR

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 11.50...12.50

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.5...12.5  
 & maximum rack tra: 19.9...20.1  
 Difference ° CS : 1.25...2.75

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 24.8...25.0

100 s: (24.5...25.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.0...4.4  
 Del.quantity cm<sup>3</sup>/ : 2.2...2.8  
 100 s: (1.9...3.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
 travel mm : 10.20...10.40  
 2nd speed rpm : 300  
 travel mm : 2.00...2.30  
 3rd speed rpm : 700  
 travel mm : 5.80...6.20  
 4th speed rpm : 1200  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 9.00...11.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950  
Aneroid pressure h : 900  
Del.quantity : 248.0...250.0  
1000 : (245.0...253.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 10.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

#### CONSTANT REGULATION

Speed rpm : 310...440

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 800  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 650  
Rack travel in m: 11.00...11.30  
4th speed rpm : 400  
Rack travel in m: 10.40...10.70

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 950

1st pressure hPa : -

B22

Rack travel in m: 7.60...7.80  
2nd pressure hPa : 450  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 280  
Rack travel in m: 8.70...9.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 140.0...142.0  
1000 s: (137.0...145.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...200.0  
1000 s: (166.0...204.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.00...4.40  
Del.quantity cm3/ : 22.0...28.0  
1000 s: (19.0...31.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 3  
Edition : 20.03.92  
Replaces : 01.92  
Test oil : ISO-4113

Combination no. : 0 402 648 914

Injection pump  
Pump designation : PE8P120A320LS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQV300...1050PA797  
-30  
Governor no. : 0 421 813 921

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.80...15.00

Del.quantity cm3/ : 22.5...22.7  
100 s: (22.2...23.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.2...6.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00  
2nd speed rpm : 625  
travel mm : 4.80...5.30  
3rd speed rpm : 830  
travel mm : 5.90...6.40  
4th speed rpm : 1108  
travel mm : 8.10...8.60  
5th speed rpm : 1190  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1130  
Rack travel in mm : 16.50...18.00

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 225.0...227.0  
1000 : (222.0...230.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 118...126

### Testing:

1st rack travel in: 13.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 82...90

### Testing:

Speed rpm : 200  
Minimum rack trave: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80

## CONSTANT REGULATION

Speed rpm : 300...500

## TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 1050  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...15.00

### Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 650

Rack travel in m: 13.80...14.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.90...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.30...9.60

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

## Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,8 o 4  
Edition : 20.03.92  
Replaces : 01.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 915  
  
Injection pump  
Pump designation : PE8P120A320LS7835  
EP type number : 0 412 628 847  
Governor  
Governor design. : RQ300/1050PA993-1  
Governor no. : 0 421 801 582

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
(5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance ± ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
  
Rack travel in mm : 14.80...15.00  
  
Del. quantity cm<sup>3</sup>/ : 22.5...22.7  
100 s: (22.2...23.0)  
  
Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.2...6.8  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 225.0...227.0  
1000 : (222.0...230.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (5.60)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...15.00

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 650  
Rack travel in m: 13.80...14.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.90...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 11.10...11.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

B26

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

## Note remarks

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Speed rpm : 1130  
Rack travel in mm : 16.50...18.00

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 225.0...227.0  
 1000 : (222.0...230.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

## 1st version

Control lever  
 position degrees: 118...126

## Testing:

1st rack travel in: 12.80  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1170...1200  
 4th rack travel in: 1250  
 Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
 position degrees: 62...70

## Testing:

Speed rpm : 200  
 Minimum rack trave: 7.40  
 Speed rpm : 350  
 Rack travel in mm : 4.80...5.40

## CONSTANT REGULATION

Speed rpm : 350...550

## TORQUE CONTROL

Dimension a mm : 0.20  
 2nd speed rpm : 1050  
 Rack travel in m: 13.80...14.00  
 3rd speed rpm : 800  
 Rack travel in m: 14.40...14.60

## Aneroid/Altitude

## Compensator Test

## 1st version

Setting  
 Speed rpm : 600  
 Pressure hPa : 900  
 Rack travel mm : 14.30...14.50

## Measurement

Speed 1/min : 600

1st pressure hPa : 300  
 Rack travel in m: 10.30...10.50  
 2nd pressure hPa : 600

Rack travel in m: 13.00...13.20  
 3rd pressure hPa : 1100  
 Rack travel in m: 14.40...14.50 \*  
 4th pressure hPa : -  
 Rack travel in m: 9.50...9.80

## START CUT-OUT

Speed 1/min : 270 (290)

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1500  
 Speed rpm : 1050  
 Del.quantity cm<sup>3</sup>/ : 214.0...217.0  
 1000 s: (211.0...220.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1500  
 Speed rpm : 800  
 Del.quantity cm<sup>3</sup>/ : 232.0...236.0  
 1000 s: (229.0...239.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: 1500  
 Speed rpm : 1050  
 Del.quantity cm<sup>3</sup>/ : 162.0...166.0 \*  
 1000 s: (159.0...169.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
 1000 s: (129.0...137.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 s: (12.0)

## BREAKAWAY

## 1st version

1mm rack travel less than

full load rack tr: 12.80  
 Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 230.0...250.0  
 1000 s: (226.0...254.0)

Remarks:

:

\* Increase in control-rod travel with  
 respect to setting at least 0.1 mm

\* = Set at reduced-delivery stop.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 648 934  
Injection pump  
Pump designation : PE8P120A320LS7823  
EP type number : 0 412 628 835  
Governor  
Governor design. : RQV350...1050PA866  
-21  
Governor no. : 0 421 813 996

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.0...5.6  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.40...1.60  
2nd speed rpm : 800  
travel mm : 4.70...5.10  
3rd speed rpm : 1100  
travel mm : 7.60...8.20  
4th speed rpm : 1175  
travel mm : 9.20...9.80

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1150  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



### 1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 234.0...237.0  
1000 : (231.0...240.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 62...70

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

### CONSTANT REGULATION

Speed rpm : 350...550

### TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 15.30...15.50

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050

Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : 1250  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 10.10...10.40

### START CUT-OUT

Speed 1/min : 270 (290)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 184.0...187.0 \*  
1000 s: (181.0...190.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1100

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

\* = Set at reduced-delivery stop.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 735 807

Injection pump  
Pump designation : PES5P120A720/3LS7250  
EP type number : 0 412 725 809  
Governor  
Governor design. : RQV325...1000PA960-9  
K  
Governor no. : 0 421 815 309

Customer-spec. information  
Customer : MAN

Engine : D2865LF06/LU06

1st version kW : 235.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

CO5

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
& maximum rack tra: 15.0...16.0  
Difference ° CS : 1.75...3.25

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 26.0...26.2

100 s: (25.7...26.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 5.9...6.3  
Del.quantity cm<sup>3</sup>/ : 4.7...5.3  
100 s: (4.4...5.6)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1060  
travel mm : 10.40...10.60  
2nd speed rpm : 300  
travel mm : 1.90...2.10  
3rd speed rpm : 450  
travel mm : 3.40...4.00  
4th speed rpm : 750  
travel mm : 6.80...7.20  
5th speed rpm : 1350  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1115

Rack travel in mm : 10.90...13.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 260.0...262.0  
1000 : (257.0...265.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 296...304

Testing:

1st rack travel in: 12.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 253...261

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 325  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 270...340

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 650  
Rack travel in m: 12.70...12.90  
4th speed rpm : 400  
Rack travel in m: 11.90...12.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 170

Rack travel in m: 9.60...9.70

3rd pressure hPa : 600

Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 245 (265)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 248.0...254.0  
1000 s: (245.0...257.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 270.0...276.0  
1000 s: (267.0...279.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.90...6.30  
Del.quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7203

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 5  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 w 2  
Edition : 13.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 736 811

Injection pump  
Pump designation : PES6P110A12ORS7213  
EP type number : 0 412 716 804  
Governor  
Governor design. : RQV400...1250PA964-3  
K  
Governor no. : 0 421 815 255

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 147.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 115...125

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
: (4.30...4.50)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.60...1.80

2nd speed rpm : 600  
travel mm : 2.80...3.30

3rd speed rpm : 1300  
travel mm : 7.20...7.40

4th speed rpm : 1500  
travel mm : 8.90...9.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 13.80

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1460...1490

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm : 275

Minimum rack travel: 7.20

Speed rpm : 400

Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90

2nd speed rpm : 800

Rack travel in m: 13.20...13.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 1250

Pressure hPa : 1200

Rack travel mm : 14.80...14.90

Measurement

Speed 1/min : 1250

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 365

Rack travel in m: 10.60...10.70

3rd pressure hPa : 690

Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 290 (300)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 156.5...162.5

1000 s: (153.5...165.5)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 90.0...94.0

1000 s: (88.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 11.90...12.90

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.50...5.70

Del.quantity cm<sup>3</sup>/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.00)

Remarks:

: C.D.C. # 3918321

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 h  
Edition : 03.04.92  
Replaces : 10.91  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 883  
  
Injection pump  
Pump designation : PES6P110A320RS7198  
EP type number : 0 412 716 802  
Governor  
Governor design. : RQV275...1250PA942K  
Governor no. : 0 421 815 234

Customer-spec. information  
Customer : RVI

Engine : MIDR06-06-26

1st version kW : 132.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70  
: (4.55...4.75)  
Rack travel in mm : 12.50...13.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.10...15.10  
& maximum rack tra: 20.0...21.0  
Difference ° CS : 2.50...4.00

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 15.7...15.9

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.7...2.2

100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.50...9.70

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 550

travel mm : 3.80...4.20

4th speed rpm : 1000

travel mm : 7.10...7.50

5th speed rpm : 1600

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1385

Rack travel in mm : 12.30...14.90

FULL LOAD DELIV. AT FULL LOAD STOP



### 1st version

Speed rpm : 1250  
Aneroid pressure h: 1000  
Del.quantity : 157.0...159.0  
1000 : (154.5...161.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 110...118

#### Testing:

1st rack travel in: 13.60  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 58...66

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 275  
Rack travel in mm : 5.00...5.20

### CONSTANT REGULATION

Speed rpm : 350...480

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 750  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 300  
Rack travel in m: 12.90...13.30

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.70

### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.20...11.60

2nd pressure hPa : 360  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 220  
Rack travel in m: 11.80...12.20

### START CUT-OUT

Speed 1/min : 200 (220)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 122.0...126.0  
1000 s: (119.0...129.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (64.5...71.5)

### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 1315...1325

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...115.0  
1000 s: (81.0...119.0)

### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.30  
Del.quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 L  
Edition : 13.03.92  
Replaces : 12.91  
Test oil : ISO-4113

Combination no. : 0 402 746 924

Injection pump  
Pump designation : PES6P110A320RS7243  
EP type number : 0 412 716 806  
Governor  
Governor design. : RQV275...1250PA942-2  
K  
Governor no. : 0 421 815 288

Customer-spec. information  
Customer : RVI

Engine : MIDRO6-06-26 L/2

1st version kW : 132.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.85...4.95  
: (4.80...5.00)  
Rack travel in mm : 13.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 13.00...13.10  
& maximum rack tra: 20.0...21.0  
Difference ° CS : 1.00...2.50

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 14.0...14.2

100 s: (13.7...14.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0  
Rack travel in mm : 5.2...5.6  
Del.quantity cm3/ : 2.4...2.8  
100 s: (2.4...2.8)  
Spread cm3 : 0.4  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
travel mm : 9.70...9.90  
2nd speed rpm : 275  
travel mm : 0.90...1.10  
3rd speed rpm : 600  
travel mm : 4.20...4.60  
4th speed rpm : 1000  
travel mm : 7.00...7.40  
5th speed rpm : 1600  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1450

Rack travel in mm : 8.80...11.40

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1250  
Aneroid pressure h : 1000  
Del.quantity : 140.0...142.0  
1000 : (137.5...144.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 272...280

##### Testing:

1st rack travel in: 12.00  
Speed rpm : 1320...1330  
2nd rack travel in: 4.00  
Speed rpm : 1465...1495  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 218...226

##### Testing:

Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 650  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 300  
Rack travel in m: 11.20...11.60

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 435  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 250  
Rack travel in m: 11.00...11.40

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 124.5...128.5  
1000 s: (124.5...128.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.5...83.5)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1320...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (96.0...124.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del.quantity cm<sup>3</sup>/ : 24.0...28.0  
1000 s: (24.0...28.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 22.01.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 925  
Injection pump  
Pump designation : PES6P120A720LS7244  
EP type number : 0 412 726 857  
Governor  
Governor design. : RQ750PA981-1  
Governor no. : 0 421 801 622

Customer-spec. information  
Customer : MAN

Engine : D2866 LXE

1st version kW : 300.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80  
                  : (4.65...4.85)  
Rack travel in mm : 18.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.30...14.40

Del.quantity cm<sup>3</sup>/ : 33.9...34.1

100 s: (33.6...34.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 4.4...4.8  
Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del.quantity : 339.0...341.0  
1000 : (336.0...344.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?...0

Testing:  
1st rack travel in: 13.30  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 788...801  
4th rack travel in: 950  
Speed rpm : 0.00...1.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 5.50

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 750...755

Remarks:  
: MAN-NR. 3-7183

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 L 1  
Edition : 13.03.92  
Replaces : 01.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 928  
  
Injection pump  
Pump designation : PES6P110A32ORS7243  
EP type number : 0 412 716 806  
Governor  
Governor design. : RQV275...1175PA942-3  
K  
Governor no. : 0 421 815 294

Customer-spec. information  
Customer : RVI

Engine : MIDRO6-06-26 M/2

1st version kW : 132.5  
Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.85...4.95  
                  : (4.80...5.00)  
Rack travel in mm : 13.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 13.40...13.50  
& maximum rack tra: 20.0...21.0  
Difference ° CS : 1.00...2.50

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 15.2...15.4

100 s: (14.9...15.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 2.3...2.7

100 s: (2.3...2.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
travel mm : 9.10...9.30

2nd speed rpm : 275  
travel mm : 0.90...1.10

3rd speed rpm : 600  
travel mm : 4.20...4.60

4th speed rpm : 1000  
travel mm : 7.00...7.40

5th speed rpm : 1600  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 8.80...11.40

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1175  
Aneroid pressure h: 1000  
Del.quantity : 152.0...154.0  
1000 : (149.5...156.5)  
Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 290...298

##### Testing:

1st rack travel in: 12.40  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 238...246

##### Testing:

Speed rpm : 200  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 300  
Rack travel in m: 11.70...12.10

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 1175  
Pressure hPa : 1000  
Rack travel mm : 13.40...13.50

#### Measurement

C17

Speed 1/min : 1175

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 420  
Rack travel in m: 11.65...11.75  
3rd pressure hPa : 240  
Rack travel in m: 10.60...10.80

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 149.0...153.0  
1000 s: (146.0...156.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (76.5...83.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0  
1000 s: (96.0...124.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.80...5.20  
Del.quantity cm3/ : 23.0...27.0  
1000 s: (23.0...27.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB6,11  
 Edition : 27.03.92  
 Replaces : 02.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 246 031  
 Injection pump  
 Pump designation : PES6MW100/720RS1515  
 EP type number : 0 413 206 013  
 Governor  
 Governor design. : RQV300...1300MW125-1  
 Governor no. : 0 420 083 258

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 127.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.00...8.40

2nd speed rpm : 960

travel mm : 5.40...5.60

3rd speed rpm : 600

travel mm : 3.20...3.80

4th speed rpm : 300

travel mm : 0.90...1.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 500  
Rack travel in m: 12.00...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.40...12.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 99.0...102.0  
1000 s: (96.5...104.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 43.0...45.0  
1000 s: (41.0...47.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 I 1  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 246 032  
  
Injection pump  
Pump designation : PES6MW100/720RS1515  
EP type number : 0 413 206 013  
Governor  
Governor design. : RQV300...1300MW125-2  
Governor no. : 0 420 083 259

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 142.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.00...8.40

2nd speed rpm : 960

travel mm : 5.40...5.60

3rd speed rpm : 600

travel mm : 3.20...3.80

4th speed rpm : 300

travel mm : 0.80...1.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1100

Del.quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 500  
Rack travel in m: 12.00...12.20  
3rd pressure hPa : 1100  
Rack travel in m: 12.40...12.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm3/ : 99.0...102.0  
1000 s: (96.5...104.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
Combination no. : 0 403 246 033  
Injection pump  
Pump designation : PES6MW100/720RS1511  
EP type number : 0 413 206 011  
Governor  
Governor design. : RGV300...1300MW125  
Governor no. : 0 420 083 257

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.1...4.3

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.00...8.40

2nd speed rpm : 960

travel mm : 5.40...5.60

3rd speed rpm : 600

travel mm : 3.20...3.80

4th speed rpm : 300

travel mm : 0.90...1.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1100

Del.quantity : 118.0...120.0

1000 : (116.0...122.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.10...7.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 500  
Rack travel in m: 10.10...10.30  
3rd pressure hPa : 1100  
Rack travel in m: 12.60...12.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm3/ : 111.5...114.5  
1000 s: (109.0...117.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.10...4.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 5,8 D  
 Edition : 20.03.92  
 Replaces : 02.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 119  
 Injection pump  
 Pump designation : PES4MW100/320RS1199  
 EP type number : 0 413 404 112  
 Governor  
 Governor design. : RQV300...1300MW110K  
 Governor no. : 0 420 083 996

Customer-spec. information  
 Customer : PERKINS

Engine : 110 TI

1st version kW : 82.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 12.00...14.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.1...6.3  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 10.00...10.40  
 2nd speed rpm : 900  
 travel mm : 6.40...6.60  
 3rd speed rpm : 480  
 travel mm : 3.10...3.70  
 4th speed rpm : 300  
 travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: ~1  
 Speed rpm : 1380  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 900  
 Del.quantity : 124.0...126.0  
 1000 : (122.0...128.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 116...124

##### Testing:

1st rack travel in: 12.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

##### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 330...500

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 800  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 500  
Rack travel in m: 10.30...10.50  
4th speed rpm : 1000  
Rack travel in m: 12.40...12.70  
5th speed rpm : 400  
Rack travel in m: 9.90...10.20

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

##### Measurement

Speed 1/min : 1300

1st pressure hPa : 130

Rack travel in m: 9.80...9.90  
2nd pressure hPa : 180  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 13.00...13.10

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 118.0...121.0  
1000 s: (115.5...123.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...80.0  
1000 s: (67.0...83.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL  
Edition : 20.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 444 135

Injection pump  
Pump designation : PES4MW100/320RS1223  
EP type number : 0 413 404 119  
Governor  
Governor design. : RQV300...1100MW122-1  
K  
Governor no. : 0 420 083 990

Customer spec. information  
Customer : VME

Engine : TD45E

1st version kW : 92.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm3/ : 12.8...13.0

100 s: (12.6...13.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 2.8...3.2

100 s: (2.5...3.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

travel mm : 10.00...10.40

2nd speed rpm : 800

travel mm : 6.10...6.30

3rd speed rpm : 500

travel mm : 3.40...4.00

4th speed rpm : 300

travel mm : 1.50...1.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 750

Del.quantity : 128.0...130.0

1000 : (126.0...132.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:



1st rack travel in: 13.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 880  
Rack travel in m: 15.00...15.10  
3rd speed rpm : 550  
Rack travel in m: 14.20...14.30  
4th speed rpm : 750  
Rack travel in m: 14.70...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 550

1st pressure hPa : 220  
Rack travel in m: 13.10...13.20  
2nd pressure hPa : 370  
Rack travel in m: 13.60...13.90  
3rd pressure hPa : 750  
Rack travel in m: 14.20...14.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750

Speed rpm : 880  
Del.quantity cm3/ : 135.5...138.5  
1000 s: (133.0...141.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 86.0...88.0  
1000 s: (84.0...90.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...155.0  
1000 s: (142.0...158.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 20.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 444 137

Injection pump  
Pump designation : PES4MM100/720RS1212  
EP type number : 0 413 404 114  
Governor  
Governor design. : RQV300...1300MW50-23  
Governor no. : 0 420 083 269

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 20.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
Combination no. : 0 403 444 138  
Injection pump  
Pump designation : PES4MW100/72ORS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1300MW50-27  
Governor no. : 0 420 083 273

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1000  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (240)

D03

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 65  
 Edition : 13.03.92  
 Replaces : 03.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 259  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW68-2  
 Governor no. : 0 420 083 224

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...9.80

2nd speed rpm : 1350  
 travel mm : 8.40...8.60

3rd speed rpm : 600  
 travel mm : 3.90...4.50

4th speed rpm : 300  
 travel mm : 0.80...1.20

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.80...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 F  
 Edition : 03.04.92  
 Replaces : 10.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 281  
 Injection pump  
 Pump designation : PES6MW100/720RS1217  
 EP type number : 0 413 406 207  
 Governor  
 Governor design. : RQ300/1000MW116  
 Governor no. : 0 420 082 056

Customer-spec. information  
 Customer : MWM

Engine : TBD226B-6

1st version kW : 150.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)

Rack travel in mm : 9.00...12.00

D06

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1100

travel mm : 7.30...7.70

2nd speed rpm : 1000

travel mm : 5.90...6.10

3rd speed rpm : 370

travel mm : 4.70...5.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (142.0...148.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1040...1055  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.1

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 7.00...7.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.80...8.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 650  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1200  
Rack travel in m: 12.50...12.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 143.5...146.5  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.0...66.0  
1000 s: (62.0...68.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1040...1055

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 95.0...105.0  
1000 s: (92.0...108.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 J 1  
Edition : 13.03.92  
Replaces : 12.91  
Test oil : ISO-4113

Combination no. : 0 403 446 291

Injection pump  
Pump designation : PES6MM100/32ORS1214  
EP type number : 0 413 406 204  
Governor  
Governor design. : RQV275...1250MM115-1  
K  
Governor no. : 0 420 083 992

Customer-spec. information  
Customer : RVI

Engine : MIDR 060226 V

1st version kw : 129.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 4.20...4.30  
: (4.15...4.35)  
Rack travel in mm : 16.50...19.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 10.3...10.5

100 s: (10.1...10.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 275.0

Rack travel in mm : 5.80...6.20

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1330  
travel mm : 9.80...10.20

2nd speed rpm : 950  
travel mm : 6.90...7.10

3rd speed rpm : 550  
travel mm : 3.60...4.20

4th speed rpm : 275  
travel mm : 0.80...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 103.0...105.0

1000 : (101.0...107.0)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1320...1340  
2nd rack travel in: 4.00  
Speed rpm : 1460...1500  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 238...246  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 7.1

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.90

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 12.30...12.50  
4th speed rpm : 500  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 12.80...12.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 180  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 140  
Rack travel in m: 12.00...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 98.5...101.5  
1000 s: (96.0...104.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 89.0...91.0  
1000 s: (87.0...93.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1320...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...112.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.80...6.20  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

#### Remarks:

:  
Set start-of-delivery sensor with  
prestroke = 4.20...4.30 mm at  
cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 298  
Injection pump  
Pump designation : PES6MW100/320RS1198  
EP type number : 0 413 406 188  
Governor  
Governor design. : RQV350...1200MW46-44  
Governor no. : 0 420 083 265

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.3...2.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
travel mm : 9.80...10.20  
2nd speed rpm : 1250  
travel mm : 7.90...8.10  
3rd speed rpm : 550  
travel mm : 3.10...3.70  
4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 800  
Aneroid pressure h: 900  
Del.quantity : 122.0...124.0  
1000 : (120.0...126.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 102...110

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1395...1405  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

#### CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 215  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 380  
Rack travel in m: 10.70...11.10

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 118.5...122.5  
1000 s: (116.5...124.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 83.0...85.0  
1000 s: (81.0...87.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1270...1290

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 12.50...13.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

: IHC #1819326C91  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 A 1  
Edition : 13.03.92  
Replaces : 01.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 299  
  
Injection pump  
Pump designation : PES6MW100/720RS1144  
EP type number : 0 413 406 138  
Governor  
Governor design. : RGV300...1200MW69-3  
Governor no. : 0 420 083 266

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366A

1st version kW : 116.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 2.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 8.80...9.20

2nd speed rpm : 1000

travel mm : 6.70...6.90

3rd speed rpm : 500

travel mm : 4.20...4.80

4th speed rpm : 300

travel mm : 1.50...1.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1240

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 112...120

Testing:

1st rack travel in: 10.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.0

Testing:

Speed rpm : 200  
Minimum rack travel: 9.50  
Speed rpm : 300  
Rack travel in mm : 7.90...8.10

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 750  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 600  
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 70.5...73.5  
1000 s: (68.0...76.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.90...8.10  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 8,8 S 5  
 Edition : 13.03.92  
 Replaces : 01.92  
 Test oil : ISO-4113

Combination no. : 0 403 446 300

Injection pump  
 Pump designation : PES6MW100/320RS1171  
 EP type number : 0 413 406 156  
 Governor  
 Governor design. : RQV300...1300MW80-7  
 Governor no. : 0 420 083 267

Customer-spec. information  
 Customer : RVI

Engine : MIDS 060212B

1st version kW : 117.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.40...5.80

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1480  
 travel mm : 9.60...10.00

2nd speed rpm : 1350  
 travel mm : 8.70...8.90

3rd speed rpm : 500  
 travel mm : 3.30...3.90

4th speed rpm : 300  
 travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 88.0...90.0  
 1000 : (86.0...92.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control Lever  
 position degrees: 116...124



Testing:

1st rack travel in: 9.80  
Speed rpm : 1395...1405  
2nd rack travel in: 4.00  
Speed rpm : 1485...1515  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 61...69  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.80...10.90

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.40  
2nd pressure hPa : 180  
Rack travel in m: 10.35...10.45  
3rd pressure hPa : 120  
Rack travel in m: 9.70...9.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1395...1405

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.80  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark made with  
prestroke 3.00...3.10 mm at barrel 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 B 12  
 Edition : 13.03.92  
 Replaces : 01.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 301  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131--  
 1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW50-22  
 Governor no. : 0 420 083 268

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 039

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...9.80

2nd speed rpm : 1350  
 travel mm : 8.50...8.70

3rd speed rpm : 450  
 travel mm : 2.60...3.20

4th speed rpm : 300  
 travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1470...1500  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.80...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 500  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 302  
  
Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1300MW50-24  
Governor no. : 0 420 083 270

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness : 8.00X2.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 8.8...9.0

100 s : (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1100  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 400  
Rack travel in m: 11.00...11.30  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

D19

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : 02.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 303  
  
Injection pump  
Pump designation : PES6MW100/72ORS1131-1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RGV300...1300MW50-25  
Governor no. : 0 420 083 271

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 155.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 350  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1000  
Rack travel in m: 13.10...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 87.0...91.0  
1000 s: (85.0...93.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 446 304

Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1200MW50-26  
Governor no. : 0 420 083 272

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 115.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.40...7.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 600  
Rack travel in m: 11.00...11.20  
3rd speed rpm : 1100  
Rack travel in m: 10.30...10.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 9.00...9.10  
2nd pressure hPa : 350  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 11.00...11.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

D23

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (42.0...48.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 305  
Injection pump  
Pump designation : PES6MM100/320RS1204  
EP type number : 0 413 406 192  
Governor  
Governor design. : RGV350...1350MM/6-45  
Governor no. : 0 420 083 275

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-360

1st version kW : 112.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 8.20...8.60

2nd speed rpm : 1350

travel mm : 7.40...7.60

3rd speed rpm : 500

travel mm : 2.50...3.10

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 87.5...89.5

1000 : (85.5...91.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 104...112

Testing:

1st rack travel in: 8.20  
Speed rpm : 1425...1455  
2nd rack travel in: 4.00  
Speed rpm : 1510...1520  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 9.20...9.30

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.90...8.10  
2nd pressure hPa : 175  
Rack travel in m: 8.30...8.40  
3rd pressure hPa : 300  
Rack travel in m: 8.70...9.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 54.5...58.5  
1000 s: (52.5...60.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1425...1455

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1819541C91

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 306  
  
Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1300MW67-6  
Governor no. : 0 420 083 274

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 28.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 112...120

### Testing:

1st rack travel in: 9.50

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1440...1470

4th rack travel in: 1550

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 74...82

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 1100  
Rack travel in m: 10.70...10.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 400  
Rack travel in m: 10.50...10.70  
3rd pressure hPa : 700  
Rack travel in m: 11.20...11.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 27.03.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 307  
Injection pump  
Pump designation : PES6MW100/320RS1198  
EP type number : 0 413 406 188  
Governor  
Governor design. : RQV350...1200MW46-46  
Governor no. : 0 420 083 276

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 157.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1200

Del.quantity : 122.0...124.0

1000 : (120.0...126.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever  
position degrees: 102...110

Testing:

1st rack travel in: 10.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1395...1405  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LCW IDLE 1

Control Lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...8.90  
2nd pressure hPa : 200  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 460  
Rack travel in m: 10.60...11.00

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 118.5...122.5  
1000 s: (116.5...124.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 70.0...72.0  
1000 s: (68.0...74.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1819485C91  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D 1  
Edition : 23.10.91  
Replaces : 10.91  
Test oil : ISO-4113

Combination no. : 0 403 456 116

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF 04

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
travel mm : 9.30...9.70

2nd speed rpm : 1255  
travel mm : 6.50...6.70

3rd speed rpm : 360  
travel mm : 3.90...4.50

4th speed rpm : 250  
travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (161.0...167.0)

Spread cm3 : 3.50

1000 : (6.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 700  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 167.0...170.0  
1000 s: (164.5...172.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7137  
Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 27.03.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 466 127

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180

Governor

Governor design. : RSV550...1100MW2A335  
-1

Governor no. : 0 420 085 185

Customer spec. information

Customer : CUMMINS

Engine : 6 CTA-8.3

1st version kW : 194.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
(3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 15.5...15.7

100 s: (15.3...15.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 6.7...6.9

Del.quantity cm<sup>3</sup>/ : 2.2...2.6

100 s: (2.0...2.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 155.5...157.5

1000 : (153.5...159.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 88...96

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.50  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1215...1225  
3rd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 750  
Rack travel in m: 14.70...14.80  
3rd speed rpm : 1000  
Rack travel in m: 14.70...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.70...14.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 370  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 575  
Rack travel in m: 13.60...14.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm3/ : 156.0...160.0  
1000 s: (154.0...162.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 100.0...102.0  
1000 s: (98.0...104.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 22.5...26.5  
1000 s: (20.0...29.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3911657

Start-of-delivery mark or blockage =  
8.5° cam rotation angle after start of  
delivery for cylinder 1.

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 466 128

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180

Governor

Governor design. : RSV550...1100MW2A335  
-2

Governer no. : 0 420 085 196

Customer-spec. information

Customer : CUMMINS

Engine : 6 CTA-8.3

1st version kW : 176.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

ED6

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 14.0...14.2

100 s: (13.8...14.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 2.2...2.6

100 s: (2.0...2.9)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 140.0...142.0

1000 : (138.0...144.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 86...94

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.30  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1215...1225  
3rd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.00...14.10  
3rd speed rpm : 1000  
Rack travel in m: 14.00...14.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 450  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 650  
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...159.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (77.0...83.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 22.5...26.5  
1000 s: (20.0...29.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3921691

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 B  
 Edition : 03.04.92  
 Replaces : 02.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 474 008  
 Injection pump  
 Pump designation : PES4MW100/720RS1181  
 EP type number : 0 413 404 107  
 Governor  
 Governor design. : RSV400...1000MW1A333  
 Governor no. : 0 420 085 118

Customer-spec. information  
 Customer : LIEBHERR

Engine : 914

1st version kw : 120.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 15.3...15.5

100 s: (15.1...15.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Del.quantity : 153.0...155.0

1000 : (151.0...157.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.20  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1175  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 980  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.30  
5th speed rpm : 450  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 154.5...157.5  
1000 s: (152.0...160.0)  
Spread cm3 : 3.50  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 474 022

Injection pump  
Pump designation : PES4MM100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RSV350...1300MWA329  
-12  
Governor no. : 0 420 085 189

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

---

Rack travel in mm : 10.80...10.90

---

Del. quantity cm<sup>3</sup>/ : 8.2...8.4

---

100 s: (8.0...8.6)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 350.0  
Rack travel in mm : 6.0...6.8  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1280  
Aneroid pressure h: 700  
Del. quantity : 82.0...84.0  
1000 : (80.0...86.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:



1st rack travel in: 9.90  
Speed rpm : 1320...1330  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1280  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 600  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 1000  
Rack travel in m: 11.70...11.90  
4th speed rpm : 1175  
Rack travel in m: 11.00...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...10.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.70...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 75.0...78.0  
1000 s: (72.5...80.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1320...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,7 C  
Edition : 13.03.92  
Replaces : 12.91  
Test oil : ISO-4113

Combination no. : 0 403 476 111

Injection pump  
Pump designation : PES6MW100/320RS1198-  
1

EP type number : 0 413 406 211  
Governor  
Governor design. : RSV350...1250MW2A347  
Governor no. : 0 420 085 182

Customer spec. information  
Customer : NAVISTAR

Engine : DT-466

1st version kW : 156.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

E12

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 12.3...12.5

100 s: (12.1...12.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 4.9...5.1  
Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
100 s: (1.3...2.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 900

Del.quantity : 123.0...125.0

1000 : (121.0...127.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.60  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1350...1360  
3rd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 4.90...5.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : 265  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 455  
Rack travel in m: 10.80...11.20  
3rd pressure hPa : 900  
Rack travel in m: 11.60...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.5...83.5  
1000 s: (77.5...85.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 15.5...19.5  
1000 s: (13.0...22.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

: CUM #1818555C91

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.03.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 113  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RSV350...1200MWA342-10  
 Governor no. : 0 420 085 187

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 132.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.00...11.20

Del.quantity cm3/ : 7.6...7.8

100 s: (7.4...8.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.5...6.0  
 Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 76.0...78.0

1000 : (74.0...80.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

#### Testing:

1st rack travel in: 10.10  
Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1280...1293  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 10.10

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.50  
Rack travel in mm : 2.00  
Speed rpm : 400...460

#### TORQUE CONTROL

Dimension a mm : 1.10  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.00...11.20  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 1000  
Rack travel in m: 11.50...11.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 300  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 700  
Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

E15

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 69.5...72.5  
1000 s: (67.0...75.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 36.0...38.0  
1000 s: (34.0...40.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1240...1245

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...6.00  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 20.03.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 117  
  
Injection pump  
Pump designation : PES6MW100/720RS1131-  
1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RSV750...1200MWOA329  
-15  
Governor no. : 0 420 085 193  
  
Customer-spec. information  
Customer : MB-NFZ  
  
Engine : OM366LA  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 419 992 198  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 089  
  
Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
  
Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1180  
Rack travel in mm : 13.20...13.30  
Del.quantity cm3/ : 10.6...10.8  
100 s: (10.4...11.0)  
Spread cm3 : 0.3  
100 s: (0.6)  
  
2nd speed rpm : 750.0  
Rack travel in mm : 5.8...6.3  
Del.quantity cm3/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1180  
Aneroid pressure h: 1000  
Del.quantity : 106.0...108.0  
1000 : (104.0...110.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 82...90

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 12.20

Speed rpm : 1230...1235 \*  
2nd rack travel in: 4.00  
Speed rpm : 1310...1318  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 750  
Rack travel in mm : 5.80...6.30

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 500  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1000  
Rack travel in m: 13.20...13.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 35.0...37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.20

E17

Speed rpm : 1230...1235

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 5.80...6.30  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

\* Read off speed set under 1.  
Add 80...88 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 120  
Injection pump  
Pump designation : PES6MM100/72ORS1131-  
1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RSV350...750MWOA336-  
6  
Governor no. : 0 420 085 198

Customer spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 87.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.8

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 74...82

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6



Testing:

1st rack travel in: 11.50  
Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...783  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 60...68  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.80  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

;  
\* Read off speed set under 1.  
Add 25...33 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SFA  
Edition : 13.4.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 406 036 032  
  
Injection pump  
Pump designation : PE6ZWM150/520/3LS33  
EP type number : 0 416 056 008  
Governor  
Governor design. : RQUV320...775ZWA64R  
Governor no. : 0 422 409 034

Customer-spec. information  
Customer : SFAC

Engine : S1 DHR1

1st version kW : 440.0  
Rated speed : 1550

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 2 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 443 022

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 027

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.00X1500

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 12.00  
Firing order : 1-5-3-6-2-4

E20

Phasing : 0-60-120-180-240-300  
Tolerance + - " : 0.50 (0..75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.00

Del. quantity cm<sup>3</sup>/ : 33.5...34.5

100 s: (33.3...34.7)

Spread cm<sup>3</sup> : 1.0

100 s: (1.5)

2nd speed rpm : 600

Rack travel in mm : 9.00

Del. quantity cm<sup>3</sup>/ : 20.0...22.0

100 s: (19.5...22.5)

Spread cm<sup>3</sup> : 1.0

100 s: (1.5)

3rd speed rpm : 200

Rack travel in mm : 9.00

Del. quantity cm<sup>3</sup>/ : 9.5...12.5

100 s: (8.8...13.2)

Spread cm<sup>3</sup> : 1.0

100 s: (1.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 74...80

Speed rpm : 775

Rack travel in mm : 14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 775

Del. quantity : 475.0...485.0

1000 : (472.0...488.0)

Spread cm<sup>3</sup> : 10.0

1000 : (15.0)

## RATED SPEED

1st version

Control lever

position degrees: 74...80

Testing:

1st rack travel in: 13.00

Speed rpm : 810...830

2nd rack travel in: 7.00

Speed rpm : 835...875  
3rd rack travel in: 2.00  
Speed rpm : 855...930  
4th rack travel in: 865...955  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 21...27

Testing:  
Speed rpm : 200  
Minimum rack trave: 12.50  
Speed rpm : 250  
Rack travel in mm : 11.50...14.00  
Rack travel in mm : 8.00  
Speed rpm : 320  
Speed rpm : 500  
Maximum rack trave: 3.30  
Speed rpm : 300  
Rack travel in mm : 9.15  
Rack travel in mm : 6.25  
Speed rpm : 340...360

LOW IDLE 2  
Control lever  
position degrees: 21...27

Testing:  
Speed rpm : 550  
Rack travel in mm : 0.00...1.70  
Speed rpm : 600  
Rack travel in mm : 0.00...1.00

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 810...830

#### STARTING FUEL DELIVERY

Speed rpm : 250  
Del.quantity cm3/ : 380.0...  
1000 s: (-)  
Rack travel in mm : 24.00

#### LOW IDLE

Speed rpm : 320  
Rack travel in mm : 8.00  
Del.quantity cm3/ : 80.0...100.0  
1000 s: (-)  
Spread cm3 : 10.0  
1000 s: (15.0)

Remarks:  
APPLICATION  
Rail car

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 9 400 083 449DD

Injection pump  
Pump designation : PES6A100b320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1100A2C2209  
R  
Governor no. : 9 420 083 201

Cust. part no. : 3354913

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3 l

1st version kW : 129.1  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1175

---

Rack travel in mm : 10.10...10.20

---

Del.quantity cm3/ : 8.7...8.9

---

100 s: (8.5...9.1)

---

Spread cm3 : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 400.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1175  
Del.quantity : 87.5...89.5  
1000 : (85.5...91.5)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 87...95

Testing:

1st rack travel in: 9.10  
Speed rpm : 1215...1225  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 570...630

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 500  
Rack travel in m: 11.30...11.50  
4th speed rpm : 800  
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 90.5...93.5  
1000 s: (88.0...96.0)  
Speed rpm : 800  
Del.quantity cm3/ : 92.5...95.5  
1000 s: (90.0...98.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1215...1225

STARTING FUEL DELIVERY

Speed rpm : 100

E23

Del.quantity cm3/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 x  
Edition : 24.10.91  
Replaces : 09.91  
Test oil : ISO-4113  
  
Combination no. : 9 400 083 459  
  
Injection pump  
Pump designation : PES6A95D12ORS2822  
EP type number : 9 400 084 029  
Governor  
Governor design. : RGV350...1250AB1235-2R  
Governor no. : 9 420 080 311

Customer-spec. information  
Customer : CUMMINS

Engine : 6 BT

1st version kW : 119.3  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
: (2.70...2.90)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300  
travel mm : 6.80...6.90

2nd speed rpm : 350  
travel mm : 1.20...1.70

3rd speed rpm : 700  
travel mm : 4.00...4.50

4th speed rpm : 1550  
travel mm : 8.30...8.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1530

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 600

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1545...1575  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION  
Speed rpm : 475...575

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.90  
2nd pressure hPa : 320  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 410  
Rack travel in m: 12.40...12.60

## START CUT-OUT

Speed 1/min : 270 (290)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 600  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 80.0...83.0  
1000 s: (77.5...85.5)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.0...67.0  
1000 s: (62.0...69.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1310...1320

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 7,8 i  
 Edition : 13.03.92  
 Replaces : 08.91  
 Test oil : ISO-4113

Combination no. : 9 400 087 419

Injection pump  
 Pump designation : PES6P120A720RS3234  
 EP type number : 9 400 087 068  
 Governor  
 Governor design. : RQV350...1150PA923-2  
 K  
 Governor no. : 9 420 080 274

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 156.6  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 85...95

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.35...2.45  
 : (2.30...2.50)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 15.8...16.0  
 100 s: (15.5...16.3)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 2.6...3.2  
 100 s: (2.4...3.4)

Spread cm3 : 0.5  
 100 s: (0.8)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 1200  
 travel mm : 9.50...9.70

2nd speed rpm : 1000  
 travel mm : 7.80...8.00

3rd speed rpm : 800  
 travel mm : 6.40...6.80

4th speed rpm : 450  
 travel mm : 3.80...4.00

5th speed rpm : 350  
 travel mm : 2.20...2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 900  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1210...1220  
2nd rack travel in: 4.00  
Speed rpm : 1335...1365  
4th rack travel in: 1420  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.70  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 390...460

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 550  
Rack travel in m: 11.30...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 300  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 500  
Rack travel in m: 12.20...12.60

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 165.0...171.0  
1000 s: (162.0...174.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 106.5...110.5  
1000 s: (104.5...112.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1210...1220

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (146.0...194.0)  
Rack travel in mm : 11.60...12.40

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 26.5...32.5  
1000 s: (24.5...34.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (3.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 9 400 087 429  
  
Injection pump  
Pump designation : PES6P120A72ORS3256-3  
EP type number : 9 400 087 079  
Governor  
Governor design. : RQV300...1300PA963  
Governor no. : 9 420 080 283

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 156.6  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 4.80...5.40

Del.quantity cm3/ : 1.7...2.0

100 s: (1.4...2.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 660

travel mm : 3.80...4.30

3rd speed rpm : 960

travel mm : 5.20...5.70

4th speed rpm : 1357

travel mm : 8.00...8.50

5th speed rpm : 1492

travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1385

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000  
Del.quantity : 17.0...20.0  
1000 : (14.0...23.0)  
Spread cm<sup>3</sup> : 2.00  
1000 : (3.00)

RATED SPEED

1st version

Control lever  
position degrees: 107...115

Testing:

1st rack travel in: 10.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 73...81

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1100  
Rack travel mm : 11.80...12.00

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.60  
2nd pressure hPa : 300  
Rack travel in m: 10.00...10.20  
3rd pressure hPa : 600  
Rack travel in m: 11.20...11.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

FO1

1st version

Aneroid pressure h: 1100  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 157.0...159.0  
1000 s: (154.0...162.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 141.0...147.0  
1000 s: (138.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 55.0...57.0  
1000 s: (52.0...60.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (86.0...114.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.20...7.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.0...19.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Start-of-delivery blocking at start of  
delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 9 400 087 430  
  
Injection pump  
Pump designation : PES6P120A720RS3256-3  
EP type number : 9 400 087 079  
Governor  
Governor design. : RGV300...1300PA963-1  
Governor no. : 9 420 080 284

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 171.5  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
(2.95...3.15)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 4.80...5.40

Del.quantity cm3/ : 1.7...2.0

100 s: (1.4...2.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 660

travel mm : 3.80...4.30

3rd speed rpm : 960

travel mm : 5.20...5.70

4th speed rpm : 1357

travel mm : 8.00...8.50

5th speed rpm : 1492

travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1385

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del.quantity : 17.0...20.0  
1000 : (14.0...23.0)  
Spread cm3 : 2.00  
1000 : (3.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50

#### CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.60  
2nd pressure hPa : 300  
Rack travel in m: 10.00...10.20  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1300  
Del.quantity cm3/ : 177.0...179.0  
1000 s: (174.0...182.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 159.0...165.0  
1000 s: (156.0...168.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 55.0...57.0  
1000 s: (52.0...60.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0  
1000 s: (96.0...124.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.20...7.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.0...19.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Start-of-delivery blocking at start of  
delivery of cylinder no. 1.

## Note remarks

Combination no. : 9 400 087 433

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.60

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1160...1190

4th rack travel in: 12.60

Speed rpm : 0.00...1.50

### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.2

### Testing:

Speed rpm : 200

Minimum rack travel: 7.70

Speed rpm : 300

Rack travel in mm : 6.00...6.40

Rack travel in mm : 2.00

Speed rpm : 380...420

### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 13.60...13.80

2nd speed rpm : 750

Rack travel in m: 14.80...15.00

### Aneroid/Altitude

#### Compensator Test

### 1st version

#### Setting

Speed rpm : 600

Pressure hPa : 800

Rack travel mm : 14.50...14.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300

Rack travel in m: 11.80...12.00

2nd pressure hPa : 550

Rack travel in m: 13.50...13.70

3rd pressure hPa : 1050

Rack travel in m: 14.70...14.80

4th pressure hPa : -

Rack travel in m: 10.70...11.00

### START CUT-OUT

Speed 1/min : 220 (240)

### FUEL DELIVERY CHARACTERISTICS

### 1st version

F05

Aneroid pressure h: 1200

Speed rpm : 1050

Del.quantity cm3/ : 192.5...196.5

1000 s: (189.5...199.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 750

Del.quantity cm3/ : 220.0...223.0

1000 s: (217.0...226.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 131.0...133.0

1000 s: (128.0...136.0)

Spread cm3 : 8.00

1000 s: (12.0)

### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 205.0...225.0

1000 s: (201.0...229.0)

Remarks:

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column  
 ect n at adjusting nut (46)  
 Test sheet : VMA  
 Edition : 16.04.92  
 replaces : -  
 Calibrating oil : ISO-4113  
 e c Injection pump : VE3/10F1600L483  
 Id- Type number : 0 460 403 016  
 . Customer Part-No. :

Customer-specific information  
 Customer : VM

Engine : HR 394 H

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
 return temp. °C  
 with thermometer : 40.00...48.00  
 Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
 assembly : 1 688 901 022

Opening  
 Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
 x Wall thickness : 2.00  
 x Length mm: 450

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
 Setting value mm: 2.50...2.90  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
 Setting value bar: 5.30...5.90  
 Shutoff  
 electromagnet Volt: 12

F06

Full-load del. w/out charge press.:

Speed 1/min: 1200  
 Del. quantity cm3/  
 1000S.: 45.00...46.00  
 Shutoff  
 electromagnet Volt: 12  
 Dispersion cm3/: 3.0  
 1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 400  
 Del. quantity cm3/  
 1000S.: 10.50...14.50  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 3.5  
 1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1720  
 Del. quantity cm3/  
 1000S.: 21.00...27.00  
 Shutoff  
 electromagnet Volt: 12

Start:

Speed 1/min: 100  
 Del. quantity cm3/: 60.00...100.00  
 mind 1000S.: 60.00  
 Shutoff  
 electromagnet Volt: 12

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

Speed 1/min: 1200  
 Inj.-qty. cm3/  
 difference 1000S.: 18.00...26.00  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 TD-travel  
 difference mm: 0.80...1.00

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1600  
 TD travel mm: 4.10...4.90  
 mm: (3.80...5.20)



Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD travel mm: 2.50...2.90  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 600  
Supply-pump  
pressure bar: 2.80...3.40

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Supply-pump  
pressure bar: 5.30...5.90

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1600  
Supply-pump  
pressure bar: 7.00...7.60  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1720  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 21.00...27.00  
1000S.: (18.00...30.00)  
8th speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 37.00...47.00  
1000S.: (36.00...48.00)

9th speed 1/min: 1600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 44.00...47.00  
1000S.: (42.50...48.50)

12th speed 1/min: 1200

Shutoff  
electromagnet Volt: 12  
Del. quynity cm3/: 45.50...46.50  
1000S.: (43.50...48.50)

20th speed 1/min: 600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 46.00...49.00  
1000S.: (44.50...50.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.50...14.50  
1000S.: (8.50...16.50)

Dispersion cm3/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 440  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.00...8.00  
1000S.: (1.00...9.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm3/ : 15.0...17.0 \*  
difference 1000S.: (15.00...17.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Inj.-qty. cm3/ : 18.0...26.0 #  
difference 1000S.: (18.00...26.00)

Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
TD-travel : 0.80...1.00 #  
difference mm: (0.80...1.00)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Supply pump-  
pressure : 0.10...0.30 \*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 65.00...95.00  
1000S.: (65.00...95.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...100.00  
1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.8...6.2  
MS mm: 0.6...1.0

Remarks:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 14.04.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1600L352  
Type number : 0 460 404 061  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 494 HP

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 1.90...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 4,80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/  
1000S.: 44.50...45.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 11.50...15.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1650  
Del. quantity cm<sup>3</sup>/  
1000S.: 27.00...33.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
mind 1000S.: 45.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 10.00...18.00  
Shutoff  
electromagnet Volt: -  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200  
TD-travel  
difference mm: 0.90...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1600  
TD travel mm: 3.60...4.40  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

# Supply-pump pressure characteristic:

2nd speed 1/min: 600  
Supply-pump pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Supply-pump pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1600  
Supply-pump pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

3rd speed 1/min: 1700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000S.: (24.00...36.00)

8th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...41.50  
1000S.: -

9th speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.00...41.00  
1000S.: (36.50...42.50)

12th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...45.50  
1000S.: (42.00...48.00)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.50...46.50  
1000S.: (42.00...48.00)

# Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

# Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

# Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.50...15.50  
1000S.: (9.50...17.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (1.00...9.00)

3rd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1200  
Inj.-qty. cm3/: 10.00...18.00  
difference 1000S.: -

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
TD-travel : 0.90...1.10  
difference mm: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...80.00  
1000S.: (50.00...80.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...85.00  
1000S.: (45.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,7...5,9  
MS mm: 0,6...1,0  
SVS max. mm: 1,3  
XK mm: 17,0...19,0  
XL mm: 14,2...17,6

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,2 F1  
Edition : 14.04.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113

Injection pump : VE4/10F2100L269-1  
Type number : 0 460 404 065  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 492.4 HJ

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 66.00...67.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 45.00...46.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 47.00...67.00  
mind 1000S.: 47.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement

correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.90...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.50...1.90  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: 4.10...4.90  
mm: (3.80...5.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.50...8.10  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.60...4.20  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000s.: (56.50...61.50)

3rd speed 1/min: 2450  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...8.00  
1000s.: (0.00...8.00)

5th speed 1/min: 2300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000s.: (26.00...34.00)

9th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.50...59.50  
1000s.: (55.00...61.00)

12th speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.00...67.00  
1000s.: (64.50...68.50)

18th speed 1/min: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...46.00  
1000s.: (43.00...48.00)

20th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 67.70...70.70  
1000s.: (66.20...72.20)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)  
2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)  
4th speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.50...5.50  
1000S.: (0.50...5.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/ : 3.00...5.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/ : 8.00...14.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.90...1.10  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0.10...0.30  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.00...72.00  
1000S.: (52.00...72.00)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 47.00...67.00  
1000S.: (47.00...67.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,6...6,0  
MS mm: 0,6...1,0  
XK mm: 20,0...22,0  
XL mm: 10,0...13,4

Remarks:

:  
:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 14.04.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2050R364  
Type number : 0 460 404 066  
Customer Part-No. :

Customer-specific information  
Customer : SOFIM

Engine : 8140.67.2580

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,2  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 2000  
Del. quantity cm3/  
1000S.: 35.00...36.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 14.00...18.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2200  
Del. quantity cm3/  
1000S.: 13.00...19.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...100.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Inj.-qty. cm3/  
difference 1000S.: 20.00...26.00 \*  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1000  
TD-travel  
difference mm: 0.40...0.60 \*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1800  
TD travel mm: 7.30...8.10  
mm: (7.00...8.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2000  
TD travel mm: 8.20...9.00  
mm: (7.90...9.30)

Shutoff  
electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Supply-pump pressure bar: 7.00...7.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Supply-pump pressure bar: 4.50...5.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12

## Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
cm<sup>3</sup>/10s: (40.60...154.00)

## Delivery-quant. and breakaway char.:

3rd speed 1/min: 2330  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...19.00  
1000S.: (12.00...20.00)

8th speed 1/min: 2150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23,50...30,50  
1000S.: -

12th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...36.00  
1000S.: (33,50...37,50)

15th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.50...41.50  
1000S.: (37.50...42.50)

17th speed 1/min: 600  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000H.: (30.50...35.50)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000S.: (29.50...36.50)

## Mech. shutoff:

## Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

## Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (11.00...21.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)

4th speed 1/min: 465  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 0.00...2.00  
1000S.: (0.00...2.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1000  
Inj.-qty. cm3/ : 19.0...21.0 #  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Inj.-qty. cm3/: + 4.0...6.0 '  
difference 1000S.: -

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1000  
TD-travel : 0.80...1.80 '  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1000  
Supply pump-  
pressure : 0.10...0.30 #  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.00...68.00  
1000S.: (48.00...68.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 28.00...38.00  
1000S.: (28.00...38.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 70.00...100.00  
1000S.: (70.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

F17

K mm: -  
KF mm: 5,6...6,0  
MS mm: 1,6...2,0  
SVS max. mm: 1,9

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 10.03.92  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE4/10F2100L414-1  
Type number : 0 460 404 073

Customer-specific information  
Customer : VM

Engine : HR 425 CLIRS

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1,2...1,6  
Shutoff  
electromagnet Volt: 12,0

Supply-pump pressure

Speed 1/min: 1000

F18

Charge press hPa: 1000  
Setting value bar: 4,7...5,3  
Shutoff  
electromagnet Volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 65,5...66,5

Shutoff  
electromagnet Volt: 12,0  
Dispersion cm3/: 3,0  
1000S.: -

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 43,0...44,0

Shutoff  
electromagnet Volt: 12,0

Low-idle speed regulation

Speed 1/min: 450  
Charge press hPa: -  
Del. quantity cm3/  
1000S.: 13,0...17,0

Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm3/: 3,0  
1000S.: -

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 40,0...46,0

Shutoff  
electromagnet Volt: 12,0

Start:

Speed 1/min: 100  
Charge press hPa: -  
Del. quantity cm3/: -  
mind 1000S.: 35,0

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: -  
Inj.-qty. cm3/  
difference 1000S.: 7,0...9,0  
Shutoff  
electromagnet Volt: 12,0

SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1500  
 Charge press hPa: -  
 Supply pump  
 pressure  
 difference bar: 0,1...0,3  
 Shutoff  
 electromagnet Volt: 12

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

1st speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1,2...1,6  
 mm: (0,7...2,1)  
 electromagnet Volt: 12,0  
 2nd speed 1/min: 1500  
 Charge press hPa: 1000  
 TD travel mm: 4,0...4,8  
 mm: (3,7...5,1)

Shutoff  
 electromagnet Volt: 12,0  
 3rd speed 1/min: 2100  
 Charge press hPa: 1000  
 TD travel mm: 7,0...7,8  
 mm: (6,7...8,1)

Shutoff  
 electromagnet Volt: 12,0

#### Supply-pump pressure characteristic:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3,8...4,4  
 Shutoff  
 electromagnet Volt: 12,0  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4,7...5,3  
 Shutoff  
 electromagnet Volt: 12,0  
 3rd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7,6...8,2  
 Shutoff  
 electromagnet Volt: 12,0

#### Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0

Overflow : 41,6...83,3  
 quantity cm3/10s: (26,6...98,3)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Overflow : 55,5...138,8  
 quantity cm3/10s: (40,5...153,3)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 7,0  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 55,5...56,5  
 1000S.: (53,5...58,5)

2nd speed 1/min: 2500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 0,0...8,0  
 1000S.: -

3rd speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 41,0...45,0  
 1000S.: (39,0...47,0)

4th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 63,0...66,0  
 1000S.: (61,5...67,5)

5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 65,5...66,5  
 1000S.: (64,0...68,0)

6th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 65,5...68,5  
 1000S.: (64,0...70,0)

7th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12,0  
 Del. quantity cm3/: 43,0...44,0  
 1000S.: (41,0...46,0)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -

Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 13,0...17,0  
1000S.: (10,0...20,0)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 2,5...7,5  
1000S.: (2,0...8,0)  
3rd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 0,0...5,0  
1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: 13,0...19,0 \*  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12,0

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
Charge press. hPa: -  
TD-travel : 1,4...1,6 \*  
Shutoff  
electromagnet Volt: 12,0

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12,0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 42,5...44,5  
1000S.: (41,0...46,0)

Automatic starting fuel delivery:

1st speed 1/min: 400  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 45,0...65,0  
1000S.: -

2nd speed 1/min: 550  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12,0  
Del. quantity cm<sup>3</sup>/: 25,0...45,0  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,2...5,6  
MS mm: 0,6...1,0  
SVS max. mm: 4,3  
LDA stroke mm: 7,0

Ajustement Potentiometer:

Angle for  
pot. °: 45  
Supply voltage  
pot. volt: 5,0  
Output volt  
pot. volt: 2,95

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 09.04.92  
replaces : 13.09.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2250R413  
Type number : 0 460 414 082  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T 4.20 (V)

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,2  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 800

Setting value mm: 4.00...4.40  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 800  
Setting value bar: 7.30...7.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 66.50...67.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 625  
Del. quantity cm3/  
1000S.: 29.50...30.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 9.00...11.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 2525  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 23.50...25.50

11

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...100.00  
mind 1000S.: 70.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 800  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 800  
TD travel mm: 4.00...4.40  
mm: (3.60...4.80)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 800  
TD travel mm: 1.90...2.70  
mm: (1.60...3.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 800  
Charge press. hPa: 800  
TD travel mm: 1.50...3.50  
mm: (1.30...3.70)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 500  
Charge press. hPa: 800  
TD travel mm: 2.10...2.30  
mm: (1.40...3.00)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 6.00...6.60  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 7.30...7.90

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 8.30...8.90  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 62.55...104.25  
quantity cm<sup>3</sup>/10s: (47.55...119.25)  
2nd speed 1/min: 2250  
Charge press. hPa: 800  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 69.50...152.90  
quantity cm<sup>3</sup>/10s: (54.50...167.90)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 6,5  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000S.: (55.50...62.50)



3rd speed 1/min: 2625  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...10.00  
 1000S.: (0.00...10.00)  
 5th speed 1/min: 2525  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 23.50...25.50  
 1000S.: (20.50...28.50)  
 9th speed 1/min: 2250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...74.00  
 1000S.: (69.00...75.00)  
 12th speed 1/min: 1250  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 66.50...67.50  
 1000S.: (64.50...69.50)  
 15th speed 1/min: 1000  
 Charge press. hPa: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...72.50  
 1000S.: (67.50...74.50)  
 18th speed 1/min: 625  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.50...30.50  
 1000S.: (27.00...33.00)  
 20th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.50...32.50  
 1000S.: (26.00...34.00)

Mech. shutoff:

Electr. shutoff:

F23

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...11.00  
 1000S.: (6.00...14.00)  
 Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (4.0)

2nd speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

Automatic starting fuel delivery:

2nd speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.00...40.00  
 1000S.: (20.00...40.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...100.00  
 1000S.: (70.00...100.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.3  
 KF mm: K-OT  
 MS mm: 0.6...1.0  
 SVS max. mm: -

LDA stroke	mm: 6.5
XK	mm: 20.0...22.0
XL	mm: 10.7...14.1

Remarks:

Overflow restriction 0.75 mm - Part No.  
..343,..344

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 09.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2100R415-1  
Type number : 0 460 414 085  
Customer Part-No. :

Customer-specific information  
Customer : FORD

Engine : 2.5L DI MY 92

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 683 901 114

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 0.35  
mm: 0.30...0.40  
Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.20...4.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000s.: 25.80...26.20 F  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000s.: 8.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000s.: (4.0)

Full-load speed regulation

Speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/  
1000s.: 23.20...25.20  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
mind 1000s.: 50.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2000  
TD travel mm: 7.50...8.30  
mm: (7.20...8.60)  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
TD travel mm: 4.20...4.60  
mm: (3.90...4.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 4.40...5.00

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 5.70...6.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply-pump  
pressure bar: 6.20...6.80

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2000  
Supply-pump  
pressure bar: 7.80...8.40

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.00...141.00  
quantity cm<sup>3</sup>/10s: (82.00...156.00)  
2nd speed 1/min: 1950  
Shutoff  
electromagnet Volt: 12  
Overflow : 115.00...184.00  
quantity cm<sup>3</sup>/10s: (100.00...199.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
HBA-stroke mm: 7.7  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.0...38.4 D  
1000S.: (34.7...39.7) D  
2nd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)  
3rd speed 1/min: 2200

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.20...25.20  
1000S.: (19.20...29.20)

4th speed 1/min: 2100  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.50...36.50  
1000S.: (27.50...39.50)

5th speed 1/min: 1700  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.50...38.90  
1000S.: (35.20...40.30)

6th speed 1/min: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.2...33.2 E  
1000S.: (30.2...35.2) E

7th speed 1/min: 500  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.00...28.0 F  
1000S.: (23.20...29.0) F

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...9.00  
1000S.: (5.00...13.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

2nd speed 1/min: 500  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...10.00  
1000S.: (0.00...12.00)

Part-load del. at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 20.0

1st speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 18.00...19.00  
1000S.: (16.00...21.00)

Automatic starting fuel delivery:

1st speed 1/min: 300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: -

2nd speed 1/min: 480

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 21.00...31.00  
1000S.: -

3rd speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 2.7...2.9

KF mm: KOT

MS mm: 1.8

HBA stroke mm: 7.7

XK mm: -

XL mm: -

Remarks:

Overflow restriction 0.75 mm - Part No.  
..343,..344 :

Pump/engine assignment:

Attach timing-device cover KDEP 1151.

Plunger lift in blocking position =

0.30...

0.40 mm referenced to outlet "A".

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 10.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R415-2  
Type number : 0 460 414 089  
Customer Part-No. :

Customer-specific information  
Customer : FORD

Engine : 2.5l DI MY 92

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 114

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 0.35  
mm: 0.30...0.40

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 25,8...26.2 F  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...8.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.50...25.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.00...7.80  
mm: (6.70...8.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250

TD travel mm: 3.80...4.20  
mm: (3.50...4.50)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 800

TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump  
pressure bar: 5.20...5.80

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1000

Supply-pump  
pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1250

Supply-pump  
pressure bar: 6.90...7.50

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 2000

Supply-pump  
pressure bar: 8.60...9.20

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Overflow : 97.30...141.70  
quantity cm<sup>3</sup>/10s: (82.30...156.70)

2nd speed 1/min: 1950

Shutoff  
electromagnet Volt: 12

Overflow : 115.30...184.80  
quantity cm<sup>3</sup>/10s: (100.30...199.80)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950

HBA-stroke mm: 7.7

Shutoff  
electromagnet Volt: 12.0

Del. quantity cm<sup>3</sup>/: 36.5...38.9 D  
1000S.: (35.2...40.2) D

2nd speed 1/min: 2400

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: -

5th speed 1/min: 2200

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 23.50...25.50  
1000S.: (19.50...29.50)

8th speed 1/min: 2100

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 31.00...37.00  
1000S.: (28.00...40.00)

10th speed 1/min: 1700

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.00...39.40  
1000S.: (35.70...40.70)

12th speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quynity cm<sup>3</sup>/: 25.80...26.20  
1000S.: (23.00...29.00)

18th speed 1/min: 1000

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.0...33.0 E  
1000S.: (30.0...35.0) E

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 425

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 6.00...8.00  
1000S.: (3.00...11.00)

Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

2nd speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...8.00  
1000S.: -

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

1st speed 1/min: 1250

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 22.50...23.50  
1000S.: (20.50...25.50)

Automatic starting fuel delivery:

1st speed 1/min: 300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: -

2nd speed 1/min: 480

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 21.00...31.00  
1000S.: -

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 2.7...2.9

KF mm: K-OT

MS mm: 1.8

HBA stroke mm: 7.7

Remarks:

⋮

\* Pump/engine assignment:

Attach timing-device cover KDEP 1151.

Plunger lift in blocking position =  
0.30...

0.40 mm referenced to outlet "A".

Overflow restriction 0.75 mm - Part No.  
..343,..344



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1500R196  
Type number : 0 460 416 042  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.05.200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.20...3.60

G03

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 24

Full-load del. w/out charge press.:

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000S.: 69.50...70.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: (3.5)  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 1650  
Del. quantity cm<sup>3</sup>/  
1000S.: 41.00...47.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 76.00...126.00  
mind 1000S.: 76.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1400  
TD travel mm: 6.20...7.00  
mm: (5.90...7.30)  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 3.20...3.60  
mm: (2.70...4.10)

Shutoff  
electromagnet Volt: 24

4th speed 1/min: 700  
 TD travel mm: 0.50...1.30  
           mm: (0.20...1.60)  
 Shutoff  
 electromagnet Volt: 24  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 700  
 Supply-pump pressure bar: 4.20...4.80  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Supply-pump pressure bar: 5.40...6.00  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1500  
 Supply-pump pressure bar: 7.40...8.00  
 Shutoff  
 electromagnet Volt: 24  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1750  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000s.: (0.00...3.00)  
 5th speed 1/min: 1650  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 41.00...47.00  
                     1000s.: (38.00...50.00)  
 8th speed 1/min: 1600  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 54.00...66.00  
                     1000s.: (52.00...68.00)  
 9th speed 1/min: 1500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 67.50...70.50  
                     1000s.: (65.50...72.50)

Shutoff  
 electromagnet Volt: 24  
 12th speed 1/min: 1300  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 69.50...70.50  
                     1000s.: (67.00...73.00)  
 15th speed 1/min: 800  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 64.50...67.50  
                     1000s.: (62.50...69.50)  
 20th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 56.00...60.00  
                     1000s.: (54.50...61.50)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000s.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000s.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 325  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 8.00...12.00  
                     1000s.: (6.00...14.00)

Dispersion cm<sup>3</sup>/: 3.0  
                     1000s.: (4.0)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 80.00...130.00  
                     1000s.: (80.00...130.00)

2nd speed 1/min: 320

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 24.00...44.00  
1000S.: (24.00...44.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 76.00...126.00  
1000S.: (76.00...126.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.9...2.1

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 4.0 F  
Edition : 14.04.92  
replaces : 23.07.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1300R346  
Type number : 0 460 424 052  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T4.40 110T

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1,0  
mm: +0,02(0,06)

Outlet : C

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.90...6.50  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 92.00...93.00  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 78.50...79.50  
Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 15.50...19.50  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1440  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 67.00...73.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 110.00...150.00  
mind 1000S.: 110.0  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.20...1.00  
mm: (0.00...1.20)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.00...7.60

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.90...6.50

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 84.50...85.50  
1000S.: (82.00...88.00)

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...28.00  
1000S.: (17.00...31.00)

3rd speed 1/min: 1580  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

5th speed 1/min: 1440  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 67.00...73.00  
1000S.: (64.00...76.00)

9th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 90.50...93.50  
1000S.: (88.50...95.50)

10th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 93.00...96.00  
1000S.: (91.00...98.00)

12th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 92.00...93.00  
1000S.: (89.50...95.50)

18th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 78.50...79.50  
1000S.: (76.00...82.00)

Mech. shutoff:

Mech. Abst.ellung:

1st speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.50...19.50  
1000S.: (12.50...22.50)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.50...10.50  
1000S.: (2.50...12.50)

4th speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 120.00...160.00  
1000S.: (115.00...165.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...75.00  
1000S.: (65.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 110.00...150.00  
1000S.: (110.00...150.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: 3,2...3,4
KF	mm: K-OT
MS	mm: 0,6...1,0
SVS max.	mm: 1,8
XK	mm: 20.0...22.0
XL	mm: 13,8...17,2

Remarks:

:  
:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P43  
Edition : 14.04.92  
replaces : 15.07.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R378-7  
Type number : 0 460 424 074  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 BT-390

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 2,35  
mm: +0,02(0,06)

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 6.00...12.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1170  
Del. quantity cm3/  
1000S.: 31.50...38.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 650  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.40...3.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1260  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1190  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...40.00  
1000S.: (10.00...40.00)  
5th speed 1/min: 1170  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...38.50  
1000S.: (29.00...41.00)  
9th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.00...65.00)  
10th speed 1/min: 900

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.80...63.80  
1000S.: (58.80...65.80)  
12th speed 1/min: 750

Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (61.00...67.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...69.00  
1000S.: (59.00...71.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...12.00  
1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 570  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)



2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: K-OT  
MS mm: 1,2...1,6  
SVS max. mm: 3,2

Remarks:  
: C.D.C. # 391 7528  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 14.04.92  
replaces : 15.07.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1350R407  
Type number : 0 460 424 075  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.25.4000 TC

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection pump setting values  
Test specifications in parentheses

Timing-device travel

Speed : 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 79.00...80.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 64.00...65.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 30.00...36.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.20...3.00  
 mm: (1.70...3.50)

Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.70...2.50)

5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 TD travel mm: 3.70...4.50  
 mm: (3.20...5.00)

Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.70...4.30

Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000

Supply-pump pressure bar: 5.70...6.30  
 Shutoff  
 electromagnet Volt: 24

3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.50...8.10

Shutoff  
 electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24

Overflow quantity cm3/10s: 41.70...83.40  
 (26.70...98.40)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000

Shutoff  
 electromagnet Volt: 24  
 Overflow quantity cm3/10s: 55.60...139.00  
 (40.60...154.00)

# Delivery-quant. and breakaway char.:

1nd speed 1/min: 600\*

# Charge-air pressure-setting point hPa: 375

LDA-stroke mm: 6,7

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 64.00...65.00  
 (60.50...68.50)

2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 0.00...3.00  
 (0.00...3.00)

5th speed 1/min: 1525  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 30.00...36.00  
 (27.00...39.00)

8th speed 1/min: 1475  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 43.00...51.00  
 (41.00...53.00)

9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 69.50...72.50  
 (67.50...74.50)

10th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 72.00...76.00  
 (70.50...77.50)

12th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quynity cm3/ 1000S.: 79.00...80.00  
 (76.00...83.00)

18th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 45.50...46.50  
 (42.50...49.50)

20th speed 1/min: 600  
 Charge press. hPa: 1000  
 Shutoff

electromagnet Volt: 24  
 Del. quantity cm3/ 1000S.: 82.50...86.50  
 (81.00...88.00)

21th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 44.00...48.00  
1000S.: (42.00...50.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 45.00...65.00  
1000S.: (45.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: 3,7
KF	mm: K-OT
MS	mm: 0,7...1,1
LDA stroke	mm: 6,7

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CDC 3,9 P60  
Edition : 14.04.92  
replaces : 15.01.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R424  
Type number : 0 460 424 079  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTAA 3.9

Power KW: 79  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.2  
mm: 0.02(0.06)

Outlet : A

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 1.00...1.40  
AFB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.50...86.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 53.50...54.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (6.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 14.50...18.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1335  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 74.00...80.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 115.00...165.00  
mind 1000S.: 115.0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 1.00...1.40  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 2.00...3.00  
mm: (1.80...3.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.50...8.10  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 69.00...70.00  
1000S.: (65.50...73.50)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 1440  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: -  
5th speed 1/min: 1325  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 72.00...78.00  
1000S.: (72.00...78.00)  
9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 81.00...86.00  
1000S.: (79.50...87.50)  
10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.00...89.00  
1000S.: (82.50...90.50)  
12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)  
18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.50...54.50  
1000S.: (50.00...58.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.50...18.50  
1000S.: (11.50...21.50)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 140.00...190.00  
1000S.: -

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 115.00...165.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm: 3.5...3.9
KF	mm: K-01
MS	mm: 0.8...1.2
SVS max.	mm: -
LDA stroke	mm: 7.0

Remarks:

: C.D.C. # 391 3443  
Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 09.04.92  
replaces : 12.07.91  
Calibrating oil : ISO 4113  
  
Injection pump : VE4/12F1100R378-8  
Type number : 0 460 424 081

Customer-specific information  
Customer : CDC

Engine : 4 BT

Power KW: 67  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.0...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0,30...0,40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253,00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2,3...2,7  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4,1...4,7  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm<sup>3</sup>/  
1000S.: 68,0...69,0

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4,0  
1000S.: (4,5)

Low-idle speed regulation

Speed 1/min: 475  
Del. quantity cm<sup>3</sup>/  
1000S.: 10,5...16,5

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5,5  
1000S.: (7,0)

Full-load speed regulation

Speed 1/min: 1175  
Del. quantity cm<sup>3</sup>/  
1000S.: 32,5...37,5

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: -  
mind 1000S.: 65,0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
electromagnet Volt: 12  
2nd speed 1/min: 900



TD travel mm: 2,3...2,7  
mm: (1,8...3,2)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 3,4...4,1  
mm: (3,0...4,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,3...2,9  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4,1...4,7  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4,9...5,5  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...154)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -  
2nd speed 1/min: 1175  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32,5...37,5  
1000S.: (30,0...40,0)  
3rd speed 1/min: 1160  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34,0...71,0  
1000S.: -  
4th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 65,5...68,5  
1000S.: (64,0...70,0)  
5th speed 1/min: 900

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68,0...69,0  
1000S.: (65,5...71,5)  
6th speed 1/min: 750

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70,0...74,0  
1000S.: (68,0...76,0)  
7th speed 1/min: 500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70,0...78,0  
1000S.: (68,0...80,0)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 475  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10,5...16,5  
1000S.: (8,5...18,5)  
2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80,0...120,0  
1000S.: -

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40,0...80,0  
1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5,0...5,4

MS mm: 1,1...1,5

SVS max. mm: 3,2

Remarks:

Overflow restriction 0.55 mm - Part No.

..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAX  
Edition : 14.04.92  
replaces : 10.10.91  
Calibrating oil : ISO 4113  
  
Injection pump : VE4/12F1400R454  
Type number : 0 460 424 082  
Customer Part-No. :

Customer-specific information  
Customer : MAXON

Engine : S4

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0,02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 2.3...2.7  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000

G21

Setting value bar: 5.0...5.6  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 83.0...84.0

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 28.0...32.0

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1480  
Del. quantity cm3/  
1000S.: 57.0...63.0

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.0...120.0  
mind 1000S.: 80.0

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0.5...1.3  
mm: (0.2...1.6)

electromagnet Volt: 12  
2nd speed 1/min: 1000  
TD travel mm: 2.3...2.7  
mm: (1.8...3.2)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1350  
TD travel mm: 3.8...4.6  
mm: (3.5...4.9)

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 4.1...4.7  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 5.0...5.6  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1350  
Supply-pump  
pressure bar: 6.5...7.1  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1535  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.0...37.0  
1000S.: (20.0...40.0)  
2nd speed 1/min: 1480  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.0...63.0  
1000S.: (54.0...66.0)  
3rd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 77.0...81.0  
1000S.: (75.5...82.5)  
4th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 83.0...84.0  
1000S.: (80.5...86.5)  
5th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.0...58.0  
1000S.: (50.0...60.0)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.0...32.0  
1000S.: (26.0...34.0)  
2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.0...16.0  
1000S.: (6.0...18.0)  
3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.0...6.0  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.0...120.0  
1000S.: -

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.0...60.0  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,2...5,6  
MS mm: 0.7...1.1

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 09.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R378-9  
Type number : 0 460 424 084  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BT 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 688 901 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.80  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.00...74.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 15.00...21.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...77.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 75.00...125.00  
mind 1000S.: 75.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.30...2.70  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.30...2.90  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1220  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: -  
5th speed 1/min: 1160  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 32.50...37.50  
1000S.: (30.00...40.00)  
8th speed 1/min: 1130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 47.00...77.00  
1000S.: -  
9th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 69.00...72.00  
1000S.: (67.50...73.50)  
12th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 73.00...74.00  
1000S.: (70.50...76.50)  
20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 77.50...85.50  
1000S.: (75.50...87.50)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1100  
Del. quantity cm3/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm3/: 0.00...3.00  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...21.00  
1000S.: (13.00...23.00)  
Dispersion cm3/: 5.5  
1000S.: (7.0)  
2nd speed 1/min: 490  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 90.00...130.00  
1000S.: -  
2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...80.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...125.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.2...1.4
XK	mm: 18.8...20.8
XL	mm: 12.5...15.9

Remarks:

: C.D.C. # 3 920 853  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 14.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1250R468  
Type number : 0 460 424 086  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.45.4180

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000

G26

Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 78.50...79.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 43.50...44.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1425  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 22.00...28.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses



# Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 3.60...4.40  
mm: (3.10...4.90)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.60...3.00  
mm: (1.90...3.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 0.10...0.90  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1250  
Charge press. hPa: 1000  
TD travel mm: 3.70...4.50  
mm: (3.20...5.00)

Shutoff  
electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.50...7.10

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.70...8.30

Shutoff  
electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 75.06...119.54  
quantity cm3/10s: (75.06...119.54)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm3/10s: (97.30...180.70)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting point hPa: 500\*  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 63.00...64.00  
1000S.: (59.50...67.50)

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1425  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 22.00...28.00  
1000S.: (19.00...31.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 70.00...73.00  
1000S.: (68.00...75.00)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 71.00...75.00  
1000S.: (69.50...76.50)

12th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quynity cm3/: 78.50...79.50  
1000S.: (75.50...82.50)

18th speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 43.50...44.50  
1000S.: (40.50...47.50)

# Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm3/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 30.00...50.00  
1000S.: (30.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.8  
KF mm: KOT  
MS mm: 0.7...1.1

Remarks:

G28

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 18.03.92  
replaces : 09.11.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R173-8  
Type number : 0 460 426 101  
Customer Part-No. :

Customer-specific information  
Customer : CUMMINS/GB

Engine : 6 BTA-590  
Speed 1/min: 1250

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 U27

Opening  
Pressure bar: 247.00...253.00

Test inj. tubing : Lochduese 0,5 mm

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80

Supply-pump pressure

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3.20...3.80

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 82.00...83.00  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 40.00...41.00

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 4.00...8.00  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...71.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 1.40...1.80  
mm: (0.90...2.30)

4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.10...2.70  
bar: (1.90...2.90)  
2nd speed 1/min: 750

Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.20...3.80  
 bar: (3.00...4.00)  
 3rd speed 1/min: 1050  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.30...4.90  
 bar: (4.10...5.10)

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 450  
 Del. quantity cm<sup>3</sup>/: 67.00...68.00  
 1000S.: (63.00...72.00)  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1330  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
 1000S.: (15.00...55.00)  
 5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 65.00...71.00  
 1000S.: (62.00...74.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 73.50...76.50  
 1000S.: (72.00...78.00)  
 10th speed 1/min: 1050  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 78.00...81.00  
 1000S.: (76.50...82.50)  
 12th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 82.00...83.00  
 1000S.: (79.50...85.50)  
 18th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 40.00...41.00  
 1000S.: (36.00...45.00)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: -4.00...4.00

#### Delivery-quant. and breakaway char.:

Inj.-qty.values,temp.-compensated temperatura

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 450  
 Del. quantity cm<sup>3</sup>/: 67.00...68.00  
 1000S.: (63.00...72.00)  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1330  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 15.50...55.50  
 1000S.: (15.50...55.50)  
 5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 65.00...71.00  
 1000S.: (62.00...74.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 73.50...76.50  
 1000S.: (72.00...78.00)  
 10th speed 1/min: 1050  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 78.00...81.00  
 1000S.: (76.50...82.50)  
 12th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 82.00...83.00  
 1000S.: (79.50...85.50)  
 18th speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: 40.00...41.00  
 1000S.: (36.00...45.00)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 82.00...90.00  
 1000S.: (86.00...86.00)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

#### Idle delivery:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 4.00...8.00  
 1000S.: (1.00...11.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del. quantity cm3/: 60.00...110.00  
1000s.: (60.00...110.00)

2nd speed 1/min: 370  
Del. quantity cm3/: 20.00...60.00  
1000s.: (20.00...60.00)

4th speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
1000s.: (70.00...120.00)

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Copl. date: : 263  
Edition : 14.04.92  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1100R402  
Type number : 0 460 426 166  
Customer Part-No. :  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA- 590 I

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 900  
Charge press. hPa: 1000  
Setting value mm: 4.80...5.20  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 900  
Charge press hPa: 1000  
Setting value bar: 4.70...5.30  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 71.50...72.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 51.00...52.00

Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...13.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1180  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 65.00...115.00  
mind 1000S.: 65.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 6.20...7.00  
mm: (5.90...7.30)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 4.80...5.20  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.50...4.30  
mm: (3.20...4.60)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.70...5.30

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 24  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24

Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...153.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 64.50...65.50  
(61.00...69.00)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)

3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 22.50...37.50  
(22.50...37.50)

5th speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 47.00...53.00  
(44.00...56.00)

9th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 59.50...62.50  
(58.00...64.00)

10th speed 1/min: 900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 61.50...64.50  
(59.50...66.50)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 71.50...72.50  
(69.00...75.00)

18th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000s.: 51.00...52.00  
(47.50...55.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100

Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 10.00...50.00  
1000S.: (10.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...115.00  
1000S.: (65.00...115.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.0...5.4

MS mm: 1.3...1.7

Remarks:  
Heavy-duty fuel-injection pump for 2  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 14.04.92  
replaces : 12.07.91  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1300R377-1  
Type number : 0 460 426 174  
Customer Part-No. :

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT 5.9 A

Power KW: 217  
Speed 1/min: 2600

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC):  $\pm 0,02(0,04)$

Start of delivery block  
Piston stroke mm: 2.35  
mm:  $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values

H07

Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000  
Setting value bar: 8.10...8.70  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.50...74.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 50.50...51.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 9.0  
1000S.: (9.0)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...11.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1400  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 54.00...60.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 1.40...1.80  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.10...8.70

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.60...9.20

Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 104.20...145.90  
quantity cm<sup>3</sup>/10s: (89.20...160.90)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Overflow : 111.20...194.60  
quantity cm<sup>3</sup>/10s: (96.20...209.60)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 475  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.00...64.00  
1000S.: (59.50...67.50)

2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1480  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: -

5th speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 54.00...60.00  
1000S.: (51.00...63.00)

9th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.00...69.00  
1000S.: (64.50...70.50)

10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 69.50...72.50  
1000S.: (67.50...74.50)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.50...74.50  
1000S.: (71.00...77.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 50.50...51.50  
1000S.: (47.00...55.00)

20th speed 1/min: 500  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: -  
1000S.: (81,50...91,50)

Mech. shutoff:  
Mech. Abst.ellung:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 50.00...110.00  
1000S.: (50.00...110.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...140.00  
1000S.: (60.00...140.00)

Shutoff electromagnet:

H09

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: K-OT
MS	mm: 1,2...1,6
SVS max.	mm: 2,2
XK	mm: 21,8...23,8
XL	mm: 10,2...13,6

Remarks:

: C.D.C. # 391 6987

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 14.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R469  
Type number : 0 460 426 198  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.45.4180

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000

H10

Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 72.50...73.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 40.50...41.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 4.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1400  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.20...2.60  
mm: (1.50...3.30)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.30...2.10)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1250  
Charge press. hPa: 1000  
TD travel mm: 3.70...4.50  
mm: (3.20...5.00)

Shutoff  
electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.20...6.80

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.70...8.30

Shutoff  
electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 75.06...119.54

quantity cm<sup>3</sup>/10s: (75.06...119.54)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (97.30...180.70)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 600\*  
Charge-air pressure-setting point hPa: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 59.50...60.50  
1000S.: (56.00...64.00)

2nd speed 1/min: 1550  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1400  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 47.00...53.00  
1000S.: (44.00...56.00)

8th speed 1/min: 1325  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 54.00...70.00  
1000S.: (54.00...70.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.50...69.50  
1000S.: (64.50...71.50)

10th speed 1/min: 1000  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 67.50...71.50  
1000S.: (66.00...73.00)

12th speed 1/min: 700  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 72.50...73.50  
1000S.: (69.50...76.50)

18th speed 1/min: 600  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.50...41.50  
1000S.: (37.50...44.50)

20th speed 1/min: 600  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 74.50...79.50  
1000S.: (72.50...81.50)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (5.0)

2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...50.00  
1000S.: (20.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: -

H12

KF mm: KOT  
MS mm: 0.7...1.1

Remarks:

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R419-2  
Type number : 0 460 426 199  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTAA 5.9

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery block  
Piston stroke mm: 1.25  
mm: +0.02(0.06)  
Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.60...2.00

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 76.00...77.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 57.50...58.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (6.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 8.50...12.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1320  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 68.00...74.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...160.00  
mind 1000S.: 100.0

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications

# Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1250  
 Charge press hPa: 1000  
 TD travel mm: 2.30...3.10  
 mm: (2.00...3.40)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.60...2.00  
 mm: (1.10...2.50)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 850  
 Charge press hPa: 1000  
 TD travel mm: 0.80...1.60  
 mm: (0.50...1.90)

Shutoff  
 electromagnet Volt: 12  
 8th speed 1/min: 450  
 Charge press. hPa: -  
 TD travel mm: 2.00...3.00  
 mm: (1.80...3.20)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.70...6.30

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.30...6.90

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.40...8.00

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.90...4.50

Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...153.00)

## Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
 Charge-air pressure-setting  
 point hPa: 230  
 LDA-stroke mm: 7.0  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 64.00...65.00  
 1000s.: (60.50...68.50)

2nd speed 1/min: 1460  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000s.: (0.00...3.00)

3rd speed 1/min: 1405  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 15.00...45.00  
 1000s.: (15.00...45.00)

5th speed 1/min: 1320  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 68.00...74.00  
 1000s.: (65.00...77.00)

9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 75.50...78.50  
 1000s.: (74.00...80.00)

10th speed 1/min: 1150  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 82.00...85.00  
 1000s.: (80.00...87.00)

12th speed 1/min: 850  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quyntity cm3/: 76.00...77.00  
 1000s.: (73.50...79.50)



18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 58.50...59.50  
1000S.: (55.00...63.00)  
20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 78.00...86.00  
1000S.: (78.00...86.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (5.50...15.50)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 470  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 110.00...170.00  
1000S.: (110.00...170.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

4th speed 1/min: 100

H15

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...160.00  
1000S.: (100.00...160.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS mm: 0.8...1.0  
LDA stroke mm: 7.0

Remarks:  
: C.D.C. # 392 1613

\* Correction at adjusting nut (46)

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F11COR371-2  
Type number : 0 460 426 201  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6 T 590

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery block  
Piston stroke mm: 1.5  
mm: +0.02(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 700  
Setting value mm: 1.30...1.70

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 700  
Setting value bar: 4.70...5.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 76.00...77.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm3/  
1000S.: 45.00...51.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...120.00  
mind 1000S.: 80.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.90...4.70  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
TD travel mm: 1.30...1.70  
mm: (0.80...2.20)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 0.00...0.70  
 mm: (0.00...1.00)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 700  
 Supply-pump pressure bar: 4.70...5.30  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 6.50...7.10  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1230  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1190  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...30.00  
 1000S.: (10.00...30.00)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1160  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.00...51.00  
 1000S.: (42.00...54.00)  
 9th speed 1/min: 1100

H17

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.50...68.50  
 1000S.: (64.00...70.00)  
 12th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 76.00...77.00  
 1000S.: (74.50...78.50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 68.00...76.00  
 1000S.: (66.00...78.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...12.00  
 1000S.: (5.00...15.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 80.00...140.00  
 1000S.: (80.00...140.00)  
 2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...80.00  
 1000S.: (40.00...80.00)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 80.00...120.00  
 1000S.: (80.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.0...5.4  
MS mm: 0.8...1.2

Remarks:  
Heavy-duty fuel-injection pump for 06  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 14.04.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2400R348  
Type number : 0 460 484 027  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 086-1.6l

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

H19

Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.30...32.30  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 7.00...9.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 3.50...4.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2650  
Del. quantity cm3/  
1000S.: 12.00...16.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 5.00...11.00 \*  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.60...0.80 \*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2250  
TD travel mm: 7.30...8.10  
mm: (7.00...8.40)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3.40...4.00  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.00...5.60  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2250  
Supply-pump  
pressure bar: 7.30...7.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
5th speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (10.00...18.00)

8th speed 1/min: 2550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.50...29.50  
1000S.: (18.50...30.50)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.50...31.50  
1000S.: (28.30...32.70)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.30...32.30  
1000S.: (29.60...34.00)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.00...26.00  
1000S.: (21.50...27.50)

Charge press. hPa: 400  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 24.0...30.0  
1000S.: (21.0...33.0)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 8.50...11.50  
1000S.: (6.00...14.00)

#### High Idle:

1st speed 1/mi: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

#### Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.50...4.50  
1000S.: (2.00...6.00)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...7.00  
1000S.: (3.50...8.50)

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: + 0.0...3.0 #  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 1.30...1.70 #  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.90...1.30 #  
difference bar: (0.70...1.50)  
Shutoff  
electromagnet Volt: 12

#### Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...35.00  
1000S.: (15.00...35.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 1,4...1,6

#### Remarks:

:  
On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1.4 A  
Edition : 13.04.92  
replaces : 02.12.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2450L331-2  
Type number : 0 460 484 033  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 031.2

Power kW: 35.0

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Setting value mm: 3.60...4.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1600  
Setting value bar: 5.90...6.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 24.30...25.30  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 2.50...3.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2700  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 32.00...82.00  
mind 1000S.: 32.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 5.50...11.50  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 0.60...0.80  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250



Supply pump  
pressure difference bar: 0.80...1.20  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1600  
TD travel mm: 3.60...4.00  
mm: (3.10...4.50)  
electromagnet Volt: 12  
2nd speed 1/min: 2250  
TD travel mm: 6.40...7.20  
mm: (6.10...7.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump pressure bar: 3.60...4.20  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1600  
Supply-pump pressure bar: 5.90...6.50  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2250  
Supply-pump pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.80...98.30)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...138.00  
(40.70...153.90)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 2975  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.50...25.50  
1000S.: (14.50...26.50)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.50...24.50  
1000S.: (21.30...25.70)

10th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...22.00  
1000S.: (14.50...24.50)

12th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.30...25.30  
1000S.: (21.80...27.80)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.50...23.50  
1000S.: (19.00...25.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.50...11.50  
1000S.: (6.50...14.50)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 5.50...8.50  
1000S.: (3.00...11.00)  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...3.50  
1000S.: (1.00...5.00)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...5.00  
1000S.: (1.50...6.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 5.50...11.50  
difference 1000S.: (4.50...12.50)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.60...0.80  
difference mm: (0.60...0.80)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.80...1.20  
difference bar: (0.60...1.40)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...80.00  
1000S.: (30.00...80.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...30.00  
1000S.: (10.00...30.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...82.00  
1000S.: (32.00...82.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.2...1.6

Remarks:  
Overflow restriction 0.55 mm - Part No.  
..303 :

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 1.9 C1  
Edition : 14.10.91  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F1500R401  
Type number : 0 460 484 036  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 028.B 1.9L.

Power KW: 38

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 1.0  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

H25

Speed 1/min: 1400  
Setting value bar: 5.80...6.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/  
1000S.: 34.50...35.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

## Low-idle speed regulation

Speed 1/min: 430  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...10.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 35.00...55.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

3rd speed 1/min: 1400  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3.70...4.30  
bar: (3.50...4.50)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1400

Supply-pump  
pressure bar: 5.80...6.40  
bar: (5.60...6.60)

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (27.80...97.30)  
2nd speed 1/min: 1400  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm3/10s: (41.70...152.90)  
Shutoff  
electromagnet Volt: 12

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...6.00)  
4th speed 1/min: 1570  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...12.00)  
5th speed 1/min: 1550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...12.00  
1000S.: (1.50...22.50)  
6th speed 1/min: 1530  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 16.50...28.50  
1000S.: (12.00...33.00)  
7th speed 1/min: 1510  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 27.00...39.00  
1000S.: (22.50...43.50)  
12th speed 1/min: 1400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 34.50...35.50  
1000S.: (32.80...37.20)  
20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 25.20...28.20  
1000S.: (23.70...29.70)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 430  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 430  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.00...10.00  
1000S.: (4.00...12.00)

Dispersion cm3/: 2.0  
1000S.: (3.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 30.00...64.00  
1000S.: (30.00...64.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.00...30.00  
1000S.: (10.00...30.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 1.1...1.5  
XK mm: 17.0...19.0  
XL mm: 11.8...15.2

Remarks:

⋮



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 P4  
Edition : 14.04.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113

Injection pump : VE4/8F2300R317-3  
Type number : 0 460 484 041  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : F8Q - 742

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

H28

Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.00...32.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 410  
Del. quantity cm3/  
1000S.: 6,5...10,5

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,5  
1000S.: (3,0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm3/  
1000S.: 22.00...28.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.30...0.50  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.40...8.20  
mm: (7.10...8.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 4.10...4.50  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 500  
TD travel mm: 1.90...4.30 B  
mm: (1.90...4.30)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 310  
TD travel mm: 0.60...3.00 A  
mm: (0.60...3.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 3.10...3.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.50...5.10  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)  
3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...15.00  
1000S.: (6.00...16.00)  
5th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000S.: (21.00...29.00)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...33.50  
1000S.: (30.20...34.80)  
10th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.30...32.30  
1000S.: (29.00...33.60)

11th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.70...32.70  
1000S.: (28.90...33.50)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...32.00  
1000S.: (29.20...33.80)

20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.10...33.10  
1000S.: (29.30...33.90)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410

Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.50...10.50  
1000S.: (4.50...12.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1.Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 1.00...5.00  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : 7.70...9.70 \*  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm3/: 9.00...13.00#  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm3/: +2.00...8.00'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.30...0.50 #  
difference mm: (0.30...0.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250

TD-travel : 0.10...0.50 '  
difference mm: (0.00...0.60)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.10...0.30 \*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.20...0.60 '  
difference bar: (0.20...0.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...45.00  
1000S.: (15.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 1,1...1,5  
SVS max. mm: 2,7

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.



\* Correction at adjusting nut (46)

A = KSB adjustment point

B = KSB curve point



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 10.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R463  
Type number : 0 460 484 051  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M708 BA/FA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 5.10...5.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 28.30...29.30  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: (2.5)  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 17.00...23.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...63.00  
mind 1000S.: 37.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 7.00...13.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.70...0.90  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2300  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)

electromagnet Volt: 12  
2nd speed 1/min: 1500  
TD travel mm: 5.10...5.50  
mm: (4.60...6.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 1.60...2.40  
mm: (1.10...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2300  
Supply-pump  
pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500

Supply-pump  
pressure bar: 5.30...5.90  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 600  
Supply-pump  
pressure bar: 3.10...3.70

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.00...83.00  
quantity cm<sup>3</sup>/10s: (26.00...98.00)  
2nd speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.00...139.00  
quantity cm<sup>3</sup>/10s: (40.00...153.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.30...29.30  
1000S.: (26.50...31.10)  
2nd speed 1/min: 2900  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...1.60  
1000S.: (0.00...1.60)

3rd speed 1/min: 2700

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...9.00  
1000S.: (0.00...10.00)

5th speed 1/min: 2500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...23.00  
1000S.: (14.00...26.00)

9th speed 1/min: 2300

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.40...31.80  
1000S.: (28.20...33.10)

10th speed 1/min: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.30...30.70  
1000S.: (27.20...31.80)

12th speed 1/min: 600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.30...31.30  
1000S.: (26.30...33.30)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)

Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...8.50)

4th speed 1/min: 550

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.50  
1000S.: (0.00...2.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
2nd speed 1/min: 1500  
3rd speed 1/min: 1500  
Inj.-qty. cm3/: 6.00...12.00  
difference 1000S.: (6.00...12.00)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1500  
5th speed 1/min: 1500

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0.70...0.90  
difference mm: (0.70...0.90)  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
3rd speed 1/min: 1500  
4th speed 1/min: 1500

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
2nd speed 1/min: 1500  
3rd speed 1/min: 1500  
4th speed 1/min: 1500

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.00...74.00  
1000S.: (48.00...74.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...45.00  
1000S.: (35.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 55.00...81.00  
1000S.: (55.00...81.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7

MS

mm: 1.6...2.0

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 K2  
Edition : 06.12.91  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE4/8F2300R464  
Type number : 0 460 484 052

Customer-specific information  
Customer : FIAT TIPO/TEMPRA

Engine : M 705

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 5,9...6,3  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 5,5...6,1

J07

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 30,5...31,5

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2,5  
1000S.: -

Low-idle speed regulation

Speed 1/min: 390  
Del. quantity cm3/  
1000S.: 8,0...12,0

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,5  
1000S.: -

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 20,0...26,0

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: -  
mind 1000S.: 37,0

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 6,0...12,0 \*

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
TD-travel  
difference mm: 1,0...1,2 \*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)

electromagnet Volt: 12  
2nd speed 1/min: 1500  
TD travel mm: 5,9...6,3  
mm: (5,4...6,8)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
TD travel mm: 8,6...9,4  
mm: (8,3...9,7)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2300  
TD travel mm: 9,4...10,2  
mm: (9,1...10,5)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 2,9...3,5

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump pressure bar: 5,5...6,1

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2300  
Supply-pump pressure bar: 7,7...8,3

Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41,6...83,3  
(26,6...98,3)  
2nd speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55,5...138,8  
(40,5...153,8)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0,0...1,6  
2nd speed 1/min: 2650

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 2,0...10,0

3rd speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 20,0...26,0  
(19,0...27,0)

4th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 31,3...33,7  
(30,2...34,8)

5th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 30,8...33,2  
(29,7...34,3)

6th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 30,5...31,5  
(28,7...33,3)

7th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 31,5...34,5  
(30,0...36,0)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 390  
Del. quantity cm<sup>3</sup>/1000s.: 0,0...3,0

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 390  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 8,0...12,0  
(5,0...15,0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0,0...3,0

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/1000s.: 6,0...8,0 #  
difference 1000s.: -

Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0,1...0,3  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40,0...60,00  
1000S.: -

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33,00...43,00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: 5,3...5,7  
MS mm: 1,3...1,7  
XK mm: 17,0...19,0  
XL mm: 10,5...13,9

Overflow restriction 0.55 mm - Part No.  
...303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1.9 K11  
Edition : 13.04.92  
replaces : 31.01.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R425-1  
Type number : 0 460 484 054  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD9AL - D70/N2/N3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 0.3  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.50...3.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 30.00...31.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.50...3.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2650  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...68.00  
mind 1000S.: 42.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 2.00...8.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 2.00...3.00  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250



### Supply pump

pressure difference bar: 1.20...1.80  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 6.70...7.50  
mm: (6.40...7.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.50...3.90  
mm: (3.00...4.40)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 3.30...3.90  
bar: (3.10...4.10)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump pressure bar: 5.70...6.30  
bar: (5.50...6.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2200  
Supply-pump pressure bar: 8.20...8.80  
bar: (8.00...9.00)

Shutoff  
electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...138.90  
cm<sup>3</sup>/10s: (41.70...152.90)

### Delivery-quant. and breakaway char.:

2nd speed 1/min: 2900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000S.: (7.00...15.00)

8th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.50...25.50  
1000S.: (17.50...27.50)

9th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...34.50  
1000S.: (31.30...35.70)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...31.00  
1000S.: (28.30...32.70)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...33.00  
1000S.: (28.50...34.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

### Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 375  
Shutoff

electromagnet Volt: 12  
Del. quantity cm3/: 6.50...8.50  
1000S.: (3.50...11.50)

High Idle:

1st speed 1/mi: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...10.50  
1000S.: (5.50...13.50)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.50...3.50  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : 2.00...8.00  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 2.00...3.00  
difference mm: (1.90...3.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 1.20...1.80  
difference bar: (1.10...1.90)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 225  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...71.00  
1000S.: (37.00...71.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...68.00  
1000S.: (42.00...68.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS mm: 1.2...1.6

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1.9 K13  
Edition : 31.01.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R425-2  
Type number : 0 460 484 055  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD9A-N2 - BVA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 0.3  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 30.00...31.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.50...3.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2650  
Del. quantity cm3/  
1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...68.00  
mind 1000S.: 42.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 2.00...8.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 1.50...2.70  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250

Supply pump  
pressure  
difference bar: 0.80...1.40  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.50...8.30  
mm: (7.20...8.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 4.40...5.00  
bar: (4.20...5.20)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 6.20...6.80  
bar: (6.00...7.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2200  
Supply-pump  
pressure bar: 8.50...9.10  
bar: (8.30...9.30)

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)  
5th speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000s.: (7.00...15.00)  
8th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.50...25.20  
1000s.: (17.50...27.50)  
9th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...34.50  
1000s.: (31.30...35.70)  
12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...31.00  
1000s.: (28.30...32.70)  
20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...33.00  
1000s.: (28.50...34.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 375  
Shutoff

electromagnet Volt: 12  
Del. quantity cm3/: 6.50...8.50  
1000S.: (3.50...11.50)

High Idle:

1st speed 1/mi: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.50...10.50  
1000S.: (5.50...13.50)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.50...3.50  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : 2.00...8.00  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 1.60...2.60  
difference mm: (1.50...2.70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.80...1.40  
difference bar: (0.70...1.50)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 225  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...71.00  
1000S.: (37.00...71.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...68.00  
1000S.: (42.00...68.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: K01  
MS mm: 1.2...1.6

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 15.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R171-3  
Type number : 0 460 484 056  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD7 L

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 0.3  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 4.30...4.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 28.00...29.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 3.50...4.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2440  
Del. quantity cm3/  
1000S.: 19.00...25.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 42.00...82.00  
mind 1000S.: 42.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 7.00...11.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 0.90...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.20...8.00  
mm: (6.90...8.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.40...3.80  
mm: (3.10...4.10)  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 0.50...1.30  
mm: (0.20...1.60)  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3.00...3.60  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2690  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.50...10.50  
1000S.: (3.50...10.50)  
3rd speed 1/min: 2540  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 11.50...17.50  
1000S.: (10.00...19.00)  
5th speed 1/min: 2440  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.00...25.00  
1000S.: (18.00...26.00)  
9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.50...29.50  
1000S.: (26.20...30.80)  
10th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.50...29.50  
1000S.: (26.20...30.80)  
11th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.00...30.00  
1000S.: (26.00...32.00)  
12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.00...29.00  
1000S.: (26.20...30.80)  
20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.00...31.00  
1000S.: (26.50...32.50)

Mech. shutoff:  
Mech. Abst.ellung:

1st speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 8.00...12.00  
1000S.: (6.00...14.00)

#### High Idle:

1st speed 1/mi: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 8.00...12.00  
1000S.: (6.00...14.00)

#### Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.50...4.50  
1000S.: (2.50...5.50)

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : 7.00...11.00#  
difference 1000S.: (4.00...14.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm3/: +2.00...8.00\*  
difference 1000S.: +(2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.90...1.10 #  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 1.00...2.00 \*  
difference mm: (0.90...2.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.50...1.10 \*  
difference bar: (0.40...1.20)  
Shutoff  
electromagnet Volt: 12

#### Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 44.00...84.00  
1000S.: (34.00...74.00)

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 14.00...34.00  
1000S.: (4.00...64.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 42.00...82.00  
1000S.: (42.00...82.00)

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.2...1.6

#### Remarks:

:  
:  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 09.04.92  
replaces : 01.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE4/9F2150L31-1  
Type number : 0 460 494 133

Customer-specific information  
Customer : MOTORI VM

Engine : HR 488 HT

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 688 901 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1900  
Charge press. hPa: 800  
Setting value mm: 6,40...6,80  
Shutoff  
electromagnet Volt: 12.0

Supply-pump pressure

Speed 1/min: 1900  
Charge press hPa: 800

J19

Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12.0

Full-load del. with charge press.:

Speed 1/min: 1600  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 46.50...47.50

Shutoff  
electromagnet Volt: 12.0  
Dispersion cm3/: 3,0  
1000S.: -

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 31.50...32.50

Shutoff  
electromagnet Volt: 12.0

Low-idle speed regulation

Speed 1/min: 400  
Charge press hPa: -  
Del. quantity cm3/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm3/: 3.0  
1000S.: -

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 27.50...33.50

Shutoff  
electromagnet Volt: 12.0

Start:

Speed 1/min: 100  
Charge press hPa: -  
Del. quantity cm3/: -  
mind 1000S.: 44.0  
Shutoff  
electromagnet Volt: 12.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press hPa: 800

TD travel mm: 1.30...2.10  
 mm: (1.00...2.40)  
 electromagnet Volt: 12.0  
 2nd speed 1/min: 1900  
 Charge press hPa: 800  
 TD travel mm: 6.40...6.80  
 mm: (5.90...7.30)  
 Shutoff  
 electromagnet Volt: 12.0  
 3rd speed 1/min: 2150  
 Charge press hPa: 800  
 TD travel mm: 7.50...8.30  
 mm: (7.20...8.60)  
 Shutoff  
 electromagnet Volt: 12.0  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 400  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 2.00...2.60  
 Shutoff  
 electromagnet Volt: 12.0  
 2nd speed 1/min: 1900  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 5.70...6.30  
 Shutoff  
 electromagnet Volt: 12.0  
 3rd speed 1/min: 2150  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 6.30...6.90  
 Shutoff  
 electromagnet Volt: 12.0  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12.0  
 Overflow : 42.00...83.00  
 quantity cm<sup>3</sup>/10s: (27.00...98.00)  
 2nd speed 1/min: 2150  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Overflow : 55.00...138.00  
 quantity cm<sup>3</sup>/10s: (40.00...153.00)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 600  
 Charge-air pressure-setting point hPa: 270  
 LDA-stroke mm: 3.8

Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 39.30...41.30  
 1000S.: (37.60...42.00)  
 2nd speed 1/min: 2600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 0.0...2.0  
 1000S.: -  
 3rd speed 1/min: 2450  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 0.0...10.0  
 1000S.: -  
 4th speed 1/min: 2300  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 27.50...33.50  
 1000S.: (26.50...34.50)  
 5th speed 1/min: 2150  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 40.00...43.00  
 1000S.: (39.2...43.80)  
 6th speed 1/min: 1600  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 46.50...47.50  
 1000S.: (44.70...49.30)  
 7th speed 1/min: 600  
 Charge press. hPa: 270  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 39.30...41.30  
 1000S.: (37.60...42.00)  
 8th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 31.50...32.50  
 1000S.: (29.80...34.20)  
 Mech. shutoff:  
 Idle delivery:  
 1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12.0  
 Del. quantity cm<sup>3</sup>/: 8.00...12.0  
 1000S.: (6.00...14.00)  
 Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: -  
 2nd speed 1/min: 500

Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 0.0...6.00  
1000S.: -  
3rd speed 1/min: 800  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 0.0...2.0  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 44.00...  
1000S.: -

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 0.0...43.0  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.3  
KF mm: 5.7...5.9  
MS mm: 0.7...0.9  
SVS max. mm: 5.6  
LDA stroke mm: 3.8  
XK mm: 20.2...22.2  
XL mm: 8.7...12.1

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200R416  
Type number : 0 460 494 273  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 890

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 043

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 0.3  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800

J22

Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.20...48.20  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.00...38.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...11.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.00...29.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 2000  
 Charge press hPa: 800  
 TD travel mm: 6.20...7.00  
 mm: (6.20...7.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press hPa: 800  
 TD travel mm: 4.00...4.40  
 mm: (3.50...4.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 800  
 TD travel mm: 1.90...2.70  
 mm: (1.60...3.00)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1800  
 Charge press. hPa: 800  
 TD travel mm: 5.70...6.50  
 mm: (5.40...6.80)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: -  
 Supply-pump pressure bar: 2.60...3.20  
 bar: (2.30...3.50)

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 5.10...5.70  
 bar: (4.80...6.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 6.90...7.50  
 bar: (6.60...7.80)

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)

2nd speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...153.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
 Charge-air pressure-setting point hPa: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 41.00...42.00  
 1000S.: (38.50...44.50)

2nd speed 1/min: 2700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 2500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 2.50...17.50  
 1000S.: (2.50...17.50)

5th speed 1/min: 2400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 23.00...29.00  
 1000S.: (22.00...30.00)

9th speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 44.10...45.10  
 1000S.: (42.80...47.40)

12th speed 1/min: 1400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 47.20...48.20  
 1000S.: (45.40...50.00)

18th speed 1/min: 600  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 37.00...38.00  
 1000S.: (34.50...40.50)

20th speed 1/min: 1000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.60...48.60  
 1000S.: (44.10...50.10)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet Volt: -

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...7.00  
1000S.: (1.00...9.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...100.00  
1000S.: (40.00...100.00)

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4

KF

MS

SVS max.

Remarks:

mm: 5.6...6.0

mm: 1.3...1.7

mm: 4.8

:  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 13.04.92  
replaces : 04.12.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R445  
Type number : 0 460 494 278  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD 9 TE-L (Cit.

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 42.00...48.00  
Electronically : 40.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 53.50...54.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 37.50...38.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Charge press hPa: -  
Del. quantity cm3/  
1000S.: 12,0...14.0

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,0  
1000S.: (3,0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 6.00...7.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2575  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 12.00...16.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 200  
Del. quantity cm3/: 50.00...56.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 11.00...15.00 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: -  
TD-travel  
difference mm: 0.90...1.10 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 6.40...7.20  
mm: (6.10...7.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 1.50...2.30  
mm: (1.20...2.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20  
bar: -

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.30...7.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 5.8  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.00...47.00  
1000S.: (43.50...49.50)

2nd speed 1/min: 2750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: -

5th speed 1/min: 2575  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...16.00  
1000S.: (10.00...18.00)

8th speed 1/min: 2375  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...43.00  
1000S.: (32.00...44.00)

9th speed 1/min: 2150  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.50...51.50  
1000S.: (48.30...52.70)

10th speed 1/min: 2000  
Charge press. hPa: 1000



Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.00...53.00  
1000S.: (49.80...54.20)  
12th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.50...54.50  
1000S.: (51.80...56.20)  
18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...38.50  
1000S.: (35.00...41.00)  
20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.50...49.50  
1000S.: (46.00...51.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: 12  
KSB/AFB  
valve Volt: -

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

Damper set qty.:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...35.00  
1000S.: -

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 12.00...14.00  
1000S.: (9.00...17.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...13.00  
1000S.: (8.00...16.00)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...7.00  
1000S.: (4.50...8.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: 2.00...8.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: -  
TD-travel : 2.10...2.50  
difference mm: (1.60...3.00)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Charge press. hPa: -  
Supply pump-  
pressure : 0.9...1.30  
difference bar: (0.7...1.50)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

2nd speed 1/min: 380  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

3rd speed 1/min: 150  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...67.00  
1000s.: -

4th speed 1/min: 200  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...56.00  
1000s.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: K-OT  
LDA stroke mm: 5.8

Remarks:  
\* Correction at adjusting nut (46)  
:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 14.04.92  
replaces : 07.02.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R432  
Type number : 0 460 494 284  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1.9L. UATL - B3

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.70...4.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

K01

Speed 1/min: 1250  
Setting value bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 9.0...11.0

Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 5.50...6.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 4.00...10.00 \*  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1. Speed 1/min: 1250  
 TD-travel difference mm: 0.60...0.80 \*  
 Shutoff  
 electromagnet Volt: 12  
  
 Inspection-pump test specifications  
 Test specifications in parentheses  
  
 Timing-device characteristic:  
  
 1st speed 1/min: 2000  
 TD travel mm: 6.50...7.30  
                     mm: (6.20...7.60)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 TD travel mm: 3.50...3.90  
                     mm: (3.00...4.40)  
  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 TD travel mm: 1.40...2.20  
                     mm: (1.10...2.50)  
  
 Shutoff  
 electromagnet Volt: 12  
  
 Supply-pump pressure characteristic:  
  
 1st speed 1/min: 750  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Supply-pump pressure bar: 5.50...6.10  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2200  
 Supply-pump pressure bar: 7.70...8.30  
 Shutoff  
 electromagnet Volt: 12  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.80...98.30)  
 2nd speed 1/min: 2200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...138.90  
 quantity cm3/10s: (40.60...153.90)  
  
 Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...6.00  
                             1000S.: (0.00...6.00)  
 5th speed 1/min: 2600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...14.00  
                             1000S.: (8.00...16.00)  
 8th speed 1/min: 2500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 21.50...31.50  
                             1000S.: (20.50...32.50)  
 9th speed 1/min: 2200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 36.50...38.50  
                             1000S.: (35.30...39.70)  
 12th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...43.00  
                             1000S.: (40.30...44.70)  
 15th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 34.00...37.00  
                             1000S.: (32.50...38.50)  
 20th speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 35.50...41.50  
                             1000S.: (33.00...44.00)  
  
 Mech. shutoff:  
  
 Electr. shutoff:  
  
 1st speed 1/min: 450  
 Del. quantity cm3/: 0.00...3.00  
                             1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
  
 Idle delivery:  
  
 Damper set qty.:  
  
 2nd speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 11.00...13.00  
                             1000S.: (8.00...16.00)  
  
 LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (6.00...14.00)

#### High Idle:

1st speed 1/mi: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (6.00...14.00)

#### Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.30...9.30  
1000S.: (5.80...10.80)

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/ : +0.0...3.00 #  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 1.10...1.50 #  
difference mm: (0.90...1.70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 1.80...2.20 #  
difference bar: (1.50...2.50)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (25.00...31.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: -

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...50.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: -

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.1...1.5

#### Remarks:

:  
:  
On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 14.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R432-4  
Type number : 0 460 494 285  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 028.D (1.9L.) B3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.70...4.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.50...6.10  
Shutoff  
electromagnet Volt: 12

K04

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 5.50...6.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 4.00...10.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 0.60...0.80  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 TD travel mm: 3.70...4.10  
                     mm: (3.20...4.60)  
  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 TD travel mm: 1.60...2.40  
                     mm: (1.30...2.70)  
  
 Shutoff  
 electromagnet Volt: 12  
  
 Supply-pump pressure characteristic:  
  
 1st speed 1/min: 750  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Supply-pump pressure bar: 5.50...6.10  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2200  
 Supply-pump pressure bar: 7.70...8.30  
 Shutoff  
 electromagnet Volt: 12  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (27.80...97.30)  
 2nd speed 1/min: 2200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...138.90  
 quantity cm<sup>3</sup>/10s: (41.70...152.90)  
  
 Delivery-quant. and breakaway char.:  
  
 2nd speed 1/min: 2750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
                             1000S.: (0.00...6.00)  
 5th speed 1/min: 2600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
                             1000S.: (8.00...16.00)  
 8th speed 1/min: 2500  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 21.50...31.50  
                             1000S.: (20.50...32.50)  
 9th speed 1/min: 2200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.70...38.70  
                             1000S.: (35.50...39.90)  
 12th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.00...43.00  
                             1000S.: (40.30...44.70)  
 15th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 33.70...36.70  
                             1000S.: (32.20...38.20)  
 20th speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.50...41.50  
                             1000S.: (33.00...44.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                             1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: --

Idle delivery:

Damper set qty.:

2nd speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 11.00...13.00  
                             1000S.: (8.00...16.00)

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...11.00  
                             1000S.: (6.00...14.00)

High Idle:

1st speed 1/mi: 500  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (6.00...14.00)

#### Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.30...9.30  
1000S.: (5.80...10.80)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 4.00...10.00#  
difference 1000S.: (3.00...11.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: +0.00...3.00\*  
difference 1000S.: +(0.00...3.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.60...0.80 #  
difference mm: (0.60...0.80)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 1.80...2.20 \*  
difference mm: (1.50...2.50)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 1.10...1.50 \*  
difference bar: (0.90...1.70)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

1st speed 1/min: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (25.00...31.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...50.00  
1000S.: (30.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.1...1.5  
SVS max. mm: 2.9

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 15.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2050R442  
Type number : 0 460 494 292  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8144.97.2400

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 683 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 12

K07

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.70...5.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 63.50...64.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 40.00...41.00

Shutoff  
electromagnet Volt: 12

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 31.00...37.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...74.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 19.00...25.00

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1000  
Charge press hPa: 1000  
TD-travel  
difference mm: 0.70...0.90  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
Charge press hPa: 1000  
TD travel mm: 8.00...8.80  
mm: (7.70...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.00...2.40  
mm: (1.70...2.70)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2050  
Charge press. hPa: 1000  
TD travel mm: 9.60...10.40  
mm: (9.30...10.70)

Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 4.80...5.60  
mm: (4.50...5.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.70...5.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.40...9.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 4.5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 54.50...55.50  
1000S.: (52.50...57.50)

2nd speed 1/min: 2750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...37.00  
1000S.: (30.00...38.00)

9th speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 62.00...65.00  
1000S.: (61.30...65.70)

12th speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (62.00...66.00)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...41.00  
1000S.: (38.00...43.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.00...14.00  
1000S.: (9.00...15.00)

High Idle:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 12.00...16.00  
1000S.: (11.00...17.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 1.00...5.00  
1000S.: (0.00...6.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Inj.-qty. cm3/: 19.00...25.00  
difference 1000S.: \*  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Inj.-qty. cm3/: 19.00...21.00  
difference 1000S.: #  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press. hPa: 1000  
Inj.-qty. cm3/: +2.00...8.00  
difference 1000S.: '  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

K09

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD-travel : 0.70...0.90 \*  
difference mm: (0.70...0.90)  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
TD-travel : 1.10...1.90 '  
difference mm: (1.10...1.90)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.10...0.30 #  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 20.00...22.00  
1000S.: (18.50...23.50)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...74.00  
1000S.: (50.00...74.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 36.00...44.00  
1000S.: (36.00...44.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...74.00  
1000S.: (50.00...74.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.6...6.0
MS	mm: 1.1...1.5
LDA stroke	mm: 4.5

Remarks:

\* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Add 12 mm spacer at 3rd part-load-quantity stop.

# EOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2350R452  
Type number : 0 460 494 299  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 784

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1125  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1125

K11

Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1125  
Del. quantity cm<sup>3</sup>/  
1000S.: 35.20...36.20

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/  
1000S.: 20.00...26.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 52.00...92.00  
mind 1000S.: 52.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 11.00...15.00 #

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1125

TD-travel  
difference mm: 0.50...0.70 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000

TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
TD travel mm: 2.60...3.00  
mm: (2.10...3.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1125  
Supply-pump  
pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.50...7.10  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...10.50  
1000S.: (1.50...11.50)  
5th speed 1/min: 2500

K12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...26.00  
1000S.: (19.00...27.00)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...36.50  
1000S.: (33.20...37.80)

10th speed 1/min: 1750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.10...36.10  
1000S.: (32.80...37.40)

12th speed 1/min: 1125  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.20...36.20  
1000S.: (33.40...38.00)

20th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.90...35.90  
1000S.: (32.10...36.70)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (6.50...14.50)

Residual:

1.Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 2.00...6.00  
1000S.: (2.00...6.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 10.0...12.0 \*  
difference 1000S.: (10.00...12.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 11.0...15.0 #  
difference 1000S.: (11.00...15.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 2.00...8.00 '  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1125  
TD-travel : 0.50...0.70 #  
difference mm: (0.50...0.70)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
TD-travel : 1.10...1.50 '  
difference mm: (1.00...1.60)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1125  
Supply pump-  
pressure : 0.10...0.30 \*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.50...24.50  
1000S.: (21.50...26.50)

Automatic starting fuel delivery:

1st speed 1/min: 210

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (45.00...85.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.00...92.00  
1000S.: (52.00...92.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.3...1.7  
SVS max. mm: 3.0

Remarks:

For adjustment of switching point  
(EGR valve), include 12.0 mm spacer  
at third fuel-delivery stop.

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2350R452-1  
Type number : 0 460 494 300  
Customer Part-No. :

Customer-specific information  
Customer : RNJR

Engine : J8S - 784 CA

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1125  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1125

K14

Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1125  
Del. quantity cm3/  
1000S.: 35.20...36.20

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 20.00...26.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 52.00...92.00  
mind 1000S.: 52.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1125  
Inj.-qty. cm3/  
difference 1000S.: 11.00...15.00 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1125  
TD-travel  
difference mm: 0.50...0.70 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000



TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1125

TD travel mm: 2.60...3.00  
mm: (2.10...3.50)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 800

TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800

Supply-pump pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1125

Supply-pump pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 2000

Supply-pump pressure bar: 6.50...7.10

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800

Shutoff  
electromagnet Volt: 12

Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)

2nd speed 1/min: 2250

Shutoff  
electromagnet Volt: 12

Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 2650

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 2.50...10.50  
1000S.: (1.50...11.50)

5th speed 1/min: 2500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 20.00...26.00  
1000S.: (19.00...27.00)

9th speed 1/min: 2250

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 34.50...36.50  
1000S.: (33.20...37.80)

10th speed 1/min: 1750

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 34.10...36.10  
1000S.: (32.80...37.40)

12th speed 1/min: 1125

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.20...36.20  
1000S.: (33.40...38.00)

20th speed 1/min: 800

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.90...35.90  
1000S.: (32.10...36.70)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (6.50...14.50)

Residual:

1.Rotacao 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 2.00...6.00  
1000S.: (2.00...6.00)

load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 10.0...12.0 \*  
difference 1000S.: (10.00...12.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 11.0...15.0 #  
difference 1000S.: (11.00...15.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: 2.00...8.00 '  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1125  
TD-travel : 0.50...0.70 #  
difference mm: (0.50...0.70)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1125  
TD-travel : 1.10...1.50 '  
difference mm: (1.00...1.60)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1125  
Supply pump-  
pressure : 0.10...0.30 \*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.50...24.50  
1000S.: (21.50...26.50)

Automatic starting fuel delivery:

1st speed 1/min: 210

K16

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (45.00...85.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.00...92.00  
1000S.: (52.00...92.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.3...1.7  
SVS max. mm: 3.0

Remarks:

For adjustment of switching point  
(EGR valve), include 12.0 mm spacer  
at third fuel-delivery stop.

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2100R471  
Type number : 0 460 494 308  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 l UD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery block  
Piston stroke mm: -  
mm: -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.70...4.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 42.00...43.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 5.50...6.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 12.00...16.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...90.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: 7.00...13.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 0.90...1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1700  
 TD travel mm: 5.60...6.40  
 mm: (5.20...6.80)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 TD travel mm: 3.70...4.10  
 mm: (3.10...4.70)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 TD travel mm: 1.10...1.90  
 mm: (0.70...2.30)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 750  
 Supply-pump pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Supply-pump pressure bar: 5.30...5.90  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1700  
 Supply-pump pressure bar: 6.60...7.20  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (27.80...97.30)  
 2nd speed 1/min: 1850  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...138.90  
 quantity cm3/10s: (41.70...152.90)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 2650  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 2400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 12.00...16.00  
 1000S.: (10.00...18.00)

8th speed 1/min: 2250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 25.00...35.00  
 1000S.: (24.00...36.00)  
 9th speed 1/min: 1850  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...42.00  
 1000S.: (38.80...43.20)  
 12th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...43.00  
 1000S.: (40.30...44.70)  
 20th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 33.50...36.50  
 1000S.: (32.00...38.00)  
 21th speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 31.50...37.50  
 1000S.: (29.00...40.00)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 425  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Damper set qty.:  
 LFG-setting:  
 solidale con carcassa:  
 Idle delivery:  
 1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 7.00...9.00  
 1000S.: (4.00...12.00)  
 High Idle:  
 1st speed 1/mi: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 7.00...9.00  
 1000S.: (4.00...12.00)  
 Residual:  
 1.Rotacao 1/min: 550

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)

2nd speed 1/min: 515  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...7.50  
1000S.: (4.00...9.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 7.00...13.00'  
difference 1000S.: (6.00...14.00)  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 6.00...8.00 #  
difference 1000S.: (6.00...8.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: +0.00...3.00\*  
difference 1000S.: +(0.00...3.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.90...1.10 #  
difference mm: (0.90...1.10)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 1.30...1.70 \*  
difference mm: (0.90...2.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.70...1.10 \*  
difference bar: (0.50...1.30)  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply pump-  
pressure : 0.10...0.30 #  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (25.00...31.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
1000S.: (40.00...90.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.2...1.4

Remarks:

:  
For adjustment of switching point  
(EGR valve), include 12.0 mm spacer  
at third fuel-delivery stop.

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEJ  
Edition : 15.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2150R474-1  
Type number : 0 460 494 313  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD11ATE-L/BVA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 0.3  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

K20

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 61.00...62.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 2.50...3.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2250  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 49.00...55.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...80.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.50...6.30  
mm: (5.20...6.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.30...2.70  
mm: (2.00...3.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 0.90...1.70  
mm: (0.60...2.00)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.30...4.90  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.00...5.60  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.10...7.70  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2000  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 750\*

Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 7.1

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...57.00  
1000S.: (53.50...59.50)

2nd speed 1/min: 2700  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000S.: (4.00...12.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...40.50  
1000S.: (33.00...41.00)

5th speed 1/min: 2250  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.00...55.00  
1000S.: (48.00...56.00)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...58.00  
1000S.: (54.20...58.80)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.50...64.50)

12th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...62.00  
1000S.: (59.20...63.80)

13th speed 1/min: 500  
Charge press. hPa: -  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...43.00  
1000S.: (40.20...44.80)

20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...63.00  
1000S.: (59.00...64.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 2000

Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 325  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...14.00  
1000S.: (10.00...16.00)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000S.: (5.00...11.00)

High Idle:

1st speed 1/mi: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...13.00  
1000S.: (9.00...15.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...3.50  
1000S.: (0.50...5.50)

Part-load del. at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...26.00  
1000S.: (22.50...28.50)

Automatic starting fuel delivery:

2nd speed 1/min: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...44.00  
1000S.: (36.50...44.50)

3rd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...78.00  
1000S.: (74.50...79.50)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...80.00  
1000S.: (68.00...82.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 0.9...1.3  
LDA stroke mm: 7.1

Remarks:

:  
Add 12 mm spacer at 3rd  
part-load-quantity stop.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200R416-1  
Type number : 0 460 494 315  
Customer Part-No. :

Customer-specific information  
Customer : RNJR

Engine : J8S - 890

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 043

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 0.3  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800

K23

Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.20...48.20  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.00...38.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...11.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.00...29.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 800  
TD travel mm: 6.20...7.00  
mm: (6.20...7.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1400  
Charge press hPa: 800  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 800  
TD travel mm: 1.90...2.70  
mm: (1.60...3.00)

Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 1800  
Charge press. hPa: 800  
TD travel mm: 5.70...6.50  
mm: (5.40...6.80)

Shutoff  
electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: -  
Supply-pump pressure bar: 2.60...3.20  
bar: (2.30...3.50)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
Supply-pump pressure bar: 5.10...5.70  
bar: (4.80...6.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump pressure bar: 6.90...7.50  
bar: (6.60...7.80)

Shutoff  
electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)

2nd speed 1/min: 2000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...153.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 41.00...42.00  
1000S.: (38.50...44.50)

2nd speed 1/min: 2700  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2500  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.50...17.50  
1000S.: (2.50...17.50)

5th speed 1/min: 2400  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 23.00...29.00  
1000S.: (22.00...30.00)

9th speed 1/min: 2000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 44.10...45.10  
1000S.: (42.80...47.40)

12th speed 1/min: 1400  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm3/: 47.20...48.20  
1000S.: (45.40...50.00)

18th speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...38.00  
1000S.: (34.50...40.50)

20th speed 1/min: 1000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.60...48.60  
1000S.: (44.10...50.10)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...7.00  
1000S.: (1.00...9.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...100.00  
1000S.: (40.00...100.00)

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4

K25

KF mm: 5.6...6.0  
MS mm: 1.3...1.7  
SVS max. mm: 4.8

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200L243-6  
Type number : 0 460 494 316  
Customer Part-No. :

Customer-specific information  
Customer : OPEL

Engine : 2,3 YD

Power KW: 54

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery block  
Piston stroke mm: -  
mm: -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 4.30...4.70  
AFB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 4.00...4.60  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/  
1000S.: 43.00...44.00

KSB/AFB 11  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 290  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...14.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/  
1000S.: 21.00...27.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 47.00...73.00  
mind 1000S.: 47.00

KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200

Inj.-qty. cm3/  
 difference 1000S.: 4.50...12.50  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 TD-travel  
 difference mm: 0.50...0.70  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2200  
 TD travel mm: 8.80...9.60  
 mm: (8.50...9.90)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 TD travel mm: 4.30...4.70  
 mm: (3.80...5.20)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 800  
 TD travel mm: 2.10...2.90  
 mm: (1.80...3.20)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 600  
 TD travel mm: 0.90...1.70  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 300A  
 TD travel mm: 2.70...4.30  
 mm: (2.50...4.50)

KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 10th speed 1/min: 800B  
 TD travel mm: 3.10...5.50  
 mm: (3.10...5.50)

KSB/AFB  
 valve Volt: -

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2200  
 Supply-pump  
 pressure bar: 6.50...7.10

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Supply-pump  
 pressure bar: 4.00...4.60

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 800  
 Supply-pump  
 pressure bar: 3.00...3.60

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 600  
 Supply-pump  
 pressure bar: 2.40...3.00

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2200

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2700  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 2600  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 2.00...10.00  
 1000S.: (1.00...11.00)  
 5th speed 1/min: 2450  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 21.00...27.00  
 1000S.: (20.00...28.00)  
 9th speed 1/min: 2200  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.50...38.50  
 1000S.: (34.70...39.30)  
 12th speed 1/min: 1200  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.00...44.00  
 1000S.: (41.20...45.80)  
 20th speed 1/min: 600  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.00...39.00  
 1000S.: (34.50...40.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 290  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: -

Idle delivery:

1st speed 1/min: 290  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (8.00...16.00)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...2.60  
 1000S.: (0.00...2.60)  
 3rd speed 1/min: 320  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 5.00...11.00  
 1000S.: (4.50...11.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
 Inj.-qty. cm<sup>3</sup>/: 6.00...8.00  
 difference 1000S.: (6.00...8.00)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1200  
 TD-travel : 0.50...0.70  
 difference mm: (0.50...0.70)  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 130  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 47.00...73.00  
 1000S.: (47.00...73.00)

2nd speed 1/min: 270  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...35.00  
 1000S.: (25.00...35.00)

4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 47.00...73.00  
1000S.: (47.00...73.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.8...1.2  
A = KSB adjustment point  
B = KSB curve point  
:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 13.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2050R476  
Type number : 0 460 494 317  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8144.97. 500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 1000  
Setting value mm: 5.80...6.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 64.50...65.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 40.00...41.00

Shutoff  
electromagnet Volt: 12

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 31.00...37.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...74.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 20.50...26.50



Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1000  
Charge press hPa: 1000  
TD-travel  
difference mm: 1.10...1.30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
Charge press hPa: 1000  
TD travel mm: 8.20...9.00  
mm: (7.70...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1400  
Charge press hPa: 1000  
TD travel mm: 5.80...6.20  
mm: (4.80...5.80)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2050  
Charge press. hPa: 1000  
TD travel mm: 9.60...10.40  
mm: (9.30...10.70)

Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 2.60...3.40  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.10...6.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.40...9.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 600\*  
Charge-air pressure-setting  
point hPa: 250  
LDA-stroke mm: 4.5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...51.00  
1000S.: (48.00...53.00)

2nd speed 1/min: 2750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...10.00  
1000S.: (2.00...10.00)

5th speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...37.00  
1000S.: (30.00...38.00)

9th speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.00...67.00  
1000S.: (63.30...67.70)

10th speed 1/min: 1950  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.00...67.00  
1000S.: (64.50...67.50)

12th speed 1/min: 1200

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.50...65.50  
1000S.: (63.00...67.00)  
18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...41.00  
1000S.: (38.00...43.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000S.: (8.00...14.00)

2nd speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000S.: (5.00...11.00)

High Idle:

1st speed 1/mi: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...9.00  
1000S.: (4.00...10.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000S.: (0.00...6.00)

2nd speed 1/min: 650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00

Load-dependent start of delivery:

LD4

Inj.-qty.dif.measurement:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 20.50...26.50  
difference 1000S.: (19.50...27.50)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD-travel : 1.10...1.30  
difference mm: (1.10...1.30)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.50...27.50  
1000S.: (24.00...29.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...74.00  
1000S.: (50.00...74.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...44.00  
1000S.: (36.00...44.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...74.00  
1000S.: (50.00...74.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.6...6.0
MS	mm: 1.1...1.5
LDA stroke	mm: 4.5

Remarks:

\* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 10.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2600R284-1  
Type number : 9 460 620 005  
Customer Part-No. : 897 040 8410

Customer-specific information  
Customer : ISUZU

Engine : 4EC1-NA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...46.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 2.70...3.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

L06

Setting value bar: 3.40...4.00  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/  
1000S.: 28.70...29.70

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.10...13.10

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2850  
Del. quantity cm<sup>3</sup>/  
1000S.: 13.90...19.90

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/  
mind 1000S.: 25.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 5.50...8.50  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
TD-travel  
difference mm: 0.20...1.30  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2300

TD travel           mm: 7.00...7.80  
                       mm: (6.70...8.10)  
 electromagnet Volt: 12  
 2nd speed       1/min: 1250  
 TD travel           mm: 2.70...3.10  
                       mm: (2.20...3.60)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed       1/min: 620  
 TD travel           mm: 0.10...0.90  
                       mm: (0.00...1.20)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed       1/min: 2000  
 TD travel           mm: 5.70...6.50  
                       mm: (5.40...6.80)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed       1/min: 1500  
 TD travel           mm: 3.70...4.30  
                       mm: (3.30...4.70)  
 Shutoff  
 electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed       1/min: 2300  
 Supply-pump  
 pressure       bar: 6.00...6.60  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed       1/min: 1250  
 Supply-pump  
 pressure       bar: 3.40...4.00  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed       1/min: 500  
 Supply-pump  
 pressure       bar: 1.60...2.20  
 Shutoff  
 electromagnet Volt: 12  
 4th speed       1/min: 2000  
 Supply-pump  
 pressure       bar: 5.20...5.80  
 Shutoff  
 electromagnet Volt: 12  
 5th speed       1/min: 1500  
 Supply-pump  
 pressure       bar: 3.90...4.50  
 Shutoff  
 electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed       1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Overflow       : 83.00...127.00  
 quantity   cm<sup>3</sup>/10s: (68.00...142.00)

#### Delivery-quant. and breakaway char.:

1st speed       1/min: 1500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.70...29.70  
                       1000S.: (26.90...31.50)  
 3rd speed       1/min: 2975  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...9.00  
                       1000S.: (0.00...9.00)  
 5th speed       1/min: 2850  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.90...19.90  
                       1000S.: (12.90...20.90)  
 8th speed       1/min: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.20...32.20  
                       1000S.: (28.70...32.70)  
 9th speed       1/min: 2000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.70...31.70  
                       1000S.: (28.00...32.40)  
 11th speed      1/min: 2400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.30...31.30  
                       1000S.: (27.50...32.10)  
 12th speed      1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.90...31.90  
                       1000S.: (27.40...33.40)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed       1/min: 400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                       1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

#### Idle delivery:

1st speed       1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.10...13.10  
                       1000S.: (7.10...15.10)  
 Dispersion   cm<sup>3</sup>/: 2.5  
                       1000S.: (3.0)  
 2nd speed       1/min: 650

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : 5.50...8.50  
difference 1000S.: (5.50...8.50)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.20...1.20  
difference mm: (0.20...1.20)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 24.00...36.00  
1000S.: (24.00...36.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 25.00...65.00  
1000S.: (25.00...65.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.2...1.6

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 09.04.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2200R365-1  
Type number : 9 460 620 007  
Customer Part-No. : 897 040 8430

Customer-specific information  
Customer : ISUZU

Engine : 4EE1-TC

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating oil  
return temp. °C  
with thermometer : 40.00...46.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 51.30...52.30

Shutoff  
electromagnet Volt: 12  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 36.80...40.80

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 8.20...12.20

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 19.20...25.20

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 38.70...48.70  
mind 1000S.: 38.70

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 26.50...29.50  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: 1000  
TD-travel  
difference mm: 1.70...2.30  
Shutoff  
electromagnet Volt: 12

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

2nd speed 1/min: 2250  
Charge press hPa: 1000  
TD travel mm: 7.20...8.00  
mm: (6.90...8.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 3.10...3.50  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2000  
Charge press. hPa: 1000  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 2250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.50...7.10  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.10...2.70  
Shutoff

electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 83.00...127.00  
quantity cm<sup>3</sup>/10s: (68.00...142.00)

#### Delivery-quant. and breakaway char.:

1nd speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 340  
LDA-stroke mm: 4.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.20...45.20  
1000s.: (42.20...47.20)

3rd speed 1/min: 2850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000s.: (0.00...5.00)

5th speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.20...25.20  
1000s.: (17.70...26.70)

8th speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.00...52.00  
1000s.: (48.20...52.80)

9th speed 1/min: 1500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.50...37.50  
1000s.: (33.70...38.30)

11th speed 1/min: 2200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.60...52.60  
1000s.: (48.80...53.40)

12th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.30...52.30  
1000s.: (49.50...54.10)

13th speed 1/min: 550  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 36.80...40.80  
1000s.: (35.80...41.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.20...12.20  
1000s.: (6.20...14.20)

Dispersion cm<sup>3</sup>/: 2.5  
1000s.: (3.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000s.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 26.50...29.50  
difference 1000s.: (26.50...29.50)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: 1000  
TD-travel : 1.70...2.30  
difference mm: (1.70...2.30)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

2nd speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.00...49.00  
1000s.: (29.00...49.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 28.70...48.70  
1000s.: (28.70...48.70)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.7...1.1  
LDA stroke mm: 4.0

Remarks:

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 30.04.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 646 266AB  
 Injection pump  
 Pump designation : PE6A95D410LS2587  
 EP type number : 0 410 696 983  
 Governor  
 Governor design. : RGV300...1150AB1088L  
 Governor no. : 0 420 212 115

Customer-spec. information  
 Customer : KHD

Engine : F6L413 FW

1st version kW : 96.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.30...8.40

Del.quantity cm<sup>3</sup>/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.60

2nd speed rpm : 390

travel mm : 2.20...2.60

3rd speed rpm : 1195

travel mm : 8.70...9.10

4th speed rpm : 1245

travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 74.0...76.0

1000 : (72.0...78.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:  
1st rack travel in: 7.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1232...1262  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: ?

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...420

TORQUE CONTROL  
Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.30...8.40  
2nd speed rpm : 800  
Rack travel in m: 9.20...9.40  
3rd speed rpm : 1000  
Rack travel in m: 8.70...9.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 77.0...80.0  
1000 s: (74.5...82.5)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 66.0...69.0 \*  
1000 s: (63.5...71.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

\* Set warm-start quantity at  
excess-fuel stop for starting  
on governor housing  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 646 266AC  
Injection pump  
Pump designation : PE6A95D410LS2587  
EP type number : 0 410 696 983  
Governor  
Governor design. : RQV300...1150AB1088L  
Governor no. : 0 420 212 115

Customer-spec. information  
Customer : KHD

Engine : F6L413 FW

1st version kW : 75.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 7.40...7.50

Del.quantity cm3/ : 6.2...6.4

100 s: (6.0...6.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.60

2nd speed rpm : 390

travel mm : 2.20...2.60

3rd speed rpm : 1195

travel mm : 8.70...9.10

4th speed rpm : 1245

travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 62.0...64.0

1000 : (60.0...66.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:

1st rack travel in: 6.40  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: ?

Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 7.40...7.50  
2nd speed rpm : 800  
Rack travel in m: 8.30...8.50  
3rd speed rpm : 1000  
Rack travel in m: 7.60...7.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm3/ : 65.0...68.0  
1000 s: (62.5...70.5)  
Speed rpm : 100  
Del.quantity cm3/ : 66.0...69.0 \*  
1000 s: (63.5...71.5)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version

L15

1mm rack travel less than

full load rack tr: 6.40  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

\* Set warm-start quantity at  
excess-fuel stop for starting  
on governor housing  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 648 148  
  
Injection pump  
Pump designation : PE8A95D410LS2608  
EP type number : 0 410 698 988  
Governor  
Governor design. : RQV450...1150AB1268L  
Governor no. : 0 420 212 243

Customer-spec. information  
Customer : KHD

Engine : F8L413F

1st version kW : 165.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
                  4- 3

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 0.30...0.60

2nd speed rpm : 750

travel mm : 3.50...3.80

3rd speed rpm : 1050

travel mm : 6.70...6.90

4th speed rpm : 1200

travel mm : 8.90...9.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 60...63

### Testing:

1st rack travel in: 8.50  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 6...14  
Speed rpm : 450  
Rack travel in mm : 6.40...6.60

## CONSTANT REGULATION

Speed rpm : 530...690

## TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 1130  
Rack travel in m: 9.50...9.70  
3rd speed rpm : 1050  
Rack travel in m: 9.80...10.10

## START CUT-OUT

Speed 1/min : 370 (390)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Speed rpm : 1130  
Del.quantity cm<sup>3</sup>/ : 86.5...89.5  
1000 s: (84.0...92.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.50  
Speed rpm : 1170...1180

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

APPLICATION

Combine-harvester

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 j 1  
 Edition : 03.04.92  
 Replaces : 11.91  
 Test oil : ISO-4113

Combination no. : 0 400 844 096

Injection pump  
 Pump designation : PES4A95D410RS2809  
 EP type number : 0 410 894 993  
 Governor  
 Governor design. : RQV300...1400AB1065-23L  
 Governor no. : 0 420 212 227

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 364

1st version kW : 65.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.90...10.00

Del.quantity cm<sup>3</sup>/ : 6.4...6.6

100 s: (6.2...6.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.5...8.7

Del.quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 64.5...66.5

1000 : (62.5...68.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 8.90  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1535...1565  
4th rack travel in: 1670  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.60  
Speed rpm : 300  
Rack travel in mm : 8.50...8.70

CONSTANT REGULATION  
Speed rpm : 550...700

TORQUE CONTROL  
Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 400  
Rack travel in m: 11.10...11.20  
3rd speed rpm : 630  
Rack travel in m: 10.90...11.20  
4th speed rpm : 925  
Rack travel in m: 10.40...10.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 400  
Del.quantity cm3/ : 49.0...53.0  
1000 s: (46.5...55.5)  
Speed rpm : 630  
Del.quantity cm3/ : 49.0...53.0  
1000 s: (46.5...55.5)  
Speed rpm : 925  
Del.quantity cm3/ : 59.0...63.0  
1000 s: (56.5...65.5)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 14.40...14.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 31.01.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 844 098  
Injection pump  
Pump designation : PES4A95D410RS2809  
EP type number : 0 410 894 993  
Governor  
Governor design. : RGV300...1400AB1065-28L  
Governor no. : 0 420 212 242

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 364

1st version kW : 65.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
: (3.15...3.35)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 6.5...6.6

100 s: (6.3...6.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.4...8.6

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 65.0...66.0

1000 : (63.0...68.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 8.90  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1535...1565  
4th rack travel in: 1670  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.60  
Speed rpm : 300  
Rack travel in mm : 8.40...8.60

CONSTANT REGULATION  
Speed rpm : 550...700

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 400  
Rack travel in m: 10.70...10.90  
3rd speed rpm : 670  
Rack travel in m: 10.50...10.70  
4th speed rpm : 1060  
Rack travel in m: 10.10...10.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 400  
Del.quantity cm3/ : 48.0...51.0  
1000 s: (45.5...53.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.90  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 14.80...15.20

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 j 4  
 Edition : 03.04.92  
 Replaces : 03.91  
 Test oil : ISO-4113

Combination no. : 0 400 846 591

Injection pump  
 Pump designation : PES6A95D410RS2797  
 EP type number : 0 410 896 900  
 Governor  
 Governor design. : RGV300...1400AB1065-22L  
 Governor no. : 0 420 212 226

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 97.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

---

Rack travel in mm : 10.10...10.20

---

Del.quantity cm<sup>3</sup>/ : 6.1...6.3

---

100 s: (5.9...6.5)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 8.9...9.1  
 Del.quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s: (0.5...1.4)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 500  
 travel mm : 2.30...2.80  
 3rd speed rpm : 750  
 travel mm : 4.10...4.30  
 4th speed rpm : 1500  
 travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1500  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1400  
 Del.quantity : 61.0...63.0  
 1000 : (59.0...65.0)

---

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 9.10  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570  
4th rack travel in: 1670  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.50  
Speed rpm : 300  
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION  
Speed rpm : 500...650

TORQUE CONTROL  
Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 400  
Rack travel in m: 11.30...11.60  
3rd speed rpm : 630  
Rack travel in m: 10.90...11.20  
4th speed rpm : 925  
Rack travel in m: 10.40...10.70

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 400  
Del.quantity cm3/ : 49.0...52.0  
1000 s: (46.5...54.5)  
Speed rpm : 630  
Del.quantity cm3/ : 49.0...53.0  
1000 s: (46.5...55.5)  
Speed rpm : 925  
Del.quantity cm3/ : 57.0...61.0  
1000 s: (54.5...63.5)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 14.60...15.00

Remarks:

:  
Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 y 2  
 Edition : 13.03.92  
 Replaces : 11.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 604  
 Injection pump  
 Pump designation : PES6A95D32ORS2779  
 EP type number : 0 410 896 903  
 Governor  
 Governor design. : RQV350...1350AB1248-2R  
 Governor no. : 0 420 213 126

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT 360

1st version kW : 127.0  
 Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 110

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

L24

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 79.5...81.5

1000 : (77.5...83.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1390...1420  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.90...12.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 110  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 300  
Rack travel in m: 11.50...11.90

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 71.0...75.0  
1000 s: (69.0...77.0)

BREAKAWAY

L25

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : NAVISTAR #1819273C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 30.04.92  
Replaces : 03.92  
Test oil : ISO-4113  
  
Combination no. : 0 400 846 606  
  
Injection pump  
Pump designation : PES6A95D32ORS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RQV350...1200AB1236-  
8R  
Governor no. : 0 420 213 127

Customer-spec. information  
Customer : NAVISTAR

Engine : DT 466

1st version kW : 145.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6 00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
: (2.60...2.80)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
travel mm : 8.60...9.00

2nd speed rpm : 1250  
travel mm : 7.30...7.50

3rd speed rpm : 550  
travel mm : 3.10...3.70

4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 900  
Del.quantity : 97.0...99.0  
1000 : (95.0...101.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1240...1270  
2nd rack travel in: 4.00  
Speed rpm : 1385...1395  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19  
Setting point w/out bumper spring  
Speed rpm : 350

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 225  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 460  
Rack travel in m: 12.30...12.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.5...78.5  
1000 s: (72.5...80.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1240...1270

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1819325C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 609  
Injection pump  
Pump designation : PES6A95D32ORS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RQV350...1350AB1248-3R  
Governor no. : 0 420 213 128

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-360

1st version kW : 127.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55  
: (2.40...2.60)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 7.3...7.5

100 s : (7.1...7.7)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.1

100 s : (1.4...2.3)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 73.5...75.5

1000 : (71.5...77.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 43...51

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1410...1430  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 200  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 380  
Rack travel in m: 10.90...11.30

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...65.0  
1000 s: (59.0...67.0)

BREAKAWAY

MD1

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1410...1430

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : NAVISTER #1819884C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L 1  
Edition : 02.05.89  
Replaces : 20.12.88  
Test oil : ISO-4113

Combination no. : 0 400 8/6 129

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1050AOC2190  
-27R  
Governor no. : 0 420 233 225

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 111.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

M02

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 8.5...8.7  
100 s : (8.3...8.9)

Spread cm<sup>3</sup> : 0.4  
100 s : (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 1.1...1.5  
100 s : (0.9...1.8)  
Spread cm<sup>3</sup> : 0.6  
100 s : (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 85.0...87.0  
1000 : (83.0...89.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 8.70  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 30...38  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 750  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 94.0...98.0  
1000 s: (92.0...100.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50

M03

Del.quantity cm<sup>3</sup>/ : 11.5...15.5  
1000 s: (9.0...18.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3912534

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 874 252  
Injection pump  
Pump designation : PES4A95D410RS2809-1  
EP type number : 0 410 894 992  
Governor  
Governor design. : RSV350...1400AOC2006  
-7L  
Governor no. : 0 420 232 575

Customer spec. information  
Customer : MERCEDES-BENZ

Engine : OM364

1st version kW : 65.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
: (3.15...3.35)

MD4

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1380

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 6.4...6.6

100 s: (6.2...6.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.4

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1380

Del.quantity : 64.5...66.5

1000 : (62.5...68.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 109...117

Testing:

1st rack travel in: 9.40

Speed rpm : 1433...1438

2nd rack travel in: 4.00

Speed rpm : 1491...1508

4th rack travel in: 1575

Speed rpm : 0.30...1.70

## LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 8.2

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 8.00...8.40  
Rack travel in mm : 2.00  
Speed rpm : 490...550

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1380  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 400  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 900  
Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 48.0...51.0  
1000 s: (45.5...53.5)  
Spread cm<sup>3</sup> : -  
1000 s: (5.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 16.30...16.70

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 8.00...8.40  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h11  
 Edition : 07.04.89  
 Replaces : 15.6.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 347  
 Injection pump  
 Pump designation : PES6A100D410RS2676  
 EP type number : 9 410 230 023  
 Governor  
 Governor design. : RSV600...1100A2C2161  
 -5L  
 Governor no. : 0 420 232 495

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466AZ-02

1st version kW : 130.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

MD6

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.10...10.20

Del.quantity cm3/ : 11.1...11.3

100 s: (10.9...11.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 111.0...113.0

1000 : (109.0...115.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52



Testing:

1st rack travel in: 9.10  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1195...1205  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 600  
Rack travel in mm : 3.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 600  
Rack travel in mm : 4.20...4.40  
Rack travel in mm : 2.00  
Speed rpm : 670...730

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 950  
Rack travel in m: 10.70...10.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 95  
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 145  
Rack travel in m: 9.80...10.20  
3rd pressure hPa : 700  
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 950  
Del.quantity cm3/ : 119.0...122.0  
1000 s: (116.5...124.5)  
Aneroid pressure h: -  
Speed rpm : 500

M07

Del.quantity cm3/ : 68.0...72.0  
1000 s: (66.0...74.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (185.0...215.0)

LOW IDLE

Speed rpm : 600  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: JOHN DEERE # RE32396

Setting without torque-control spring  
retainer with 1 mm control-rod travel  
less. Raising of full-load delivery  
with torque-control spring retainer to  
10.1 mm control-rod travel.

Start-of-delivery mark = 15.5° after  
start of delivery cyl. 1.

APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h15  
Edition : 17.05.90  
Replaces : 2.5.90  
Test oil : ISO-4113

Combination no. : 0 400 876 371

Injection pump  
Pump designation : PES6A100D410RS2676-1  
EP type number : 9 410 230 024  
Governor  
Governor design. : RSV450...1050AOC2204  
-6L  
Governor no. : 0 420 232 539

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466AT13

1st version kW : 120.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

M08

Prestroke mm : 2.45...2.55  
: (2.40...2.60)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.10...10.20

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 1.7...2.1  
100 s: (1.5...2.3)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 35...43

Testing:

1st rack travel in: 9.10  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 650  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 17.5...21.5  
1000 s: (15.5...23.5)

Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE44344  
Start-of-delivery mark at control-rod  
travel 10.5 mm and 15° after start of  
delivery.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

#### APPLICATION

Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE  
Edition : 13.03.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 876 395  
  
Injection pump  
Pump designation : PES6A100D410RS2676  
EP type number : 9 410 230 023  
Governor  
Governor design. : RSV425...1100A2C2161  
-1L  
Governor no. : 9 420 234 133

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466T

1st version kW : 120.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

M10

Prestroke mm : 2.45...2.55  
: (2.40...2.60)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.40...9.50

Del.quantity cm<sup>3</sup>/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
100 s: (1.8...2.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 98.5...100.5

1000 : (96.5...102.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

#### Testing:

1st rack travel in: 8.40  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

##### Control lever

position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.30...5.50

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1100  
Rack travel in m: 9.40...9.40  
2nd speed rpm : 750  
Rack travel in m: 10.60...10.80

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.60...10.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 80  
Rack travel in m: 9.40...9.80  
3rd pressure hPa : 175  
Rack travel in m: 10.30...10.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 116.0...119.0  
1000 s: (114.0...121.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 86.0...90.0  
1000 s: (84.0...92.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 20.5...24.5  
1000 s: (18.5...26.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE23746

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark = 15.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,6 y1  
 Edition : 18.12.91  
 Replaces : 10.85  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 512  
 Injection pump  
 Pump designation : PE6P120A32ORS415-1  
 EP type number : 0 411 826 123  
 Governor  
 Governor design. : RQ250/1100PA417R  
 Governor no. : 0 421 801 084

Customer-spec. information  
 Customer : DAF

Engine : DKX 1160

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

M12

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 11.60...11.70  
 Del. quantity cm<sup>3</sup>/ : 18.7...18.9  
 100 s: (18.4...19.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.7...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 700  
 Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 700  
 Del. quantity : 187.0...189.0  
 1000 : (184.0...192.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 700  
 Rack travel in mm : 16.0

Testing:  
 1st rack travel in: 10.60  
 Speed rpm : 1125...1140  
 2nd rack travel in: 4.00  
 Speed rpm : 1190...1220  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 7.40

Speed rpm : 250

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 450...490

#### TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.60...12.70

2nd speed rpm : 1080

Rack travel in m: 12.50...12.70

Aneroid/Altitude

Compensator Test

#### 1st version

Setting

Speed rpm : 600

Pressure hPa : 700

Rack travel mm : 11.60...11.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 300

Rack travel in m: 11.30...11.40

3rd pressure hPa : 250

Rack travel in m: 10.60...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 140.0...142.0

1000 s: (137.0...145.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1125...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 305.0...345.0

1000 s: (305.0...345.0)

Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.40...6.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 9,7 f 1  
Edition : 24.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 401 846 554  
Injection pump  
Pump designation : PE6P110A72ORS516  
EP type number : 0 411 816 176  
Governor  
Governor design. : RQ300/1100PA412-2  
Governor no. : 0 421 801 435

Customer-spec. information  
Customer : STEYR

Engine : WD615.64

1st version kW : 175.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00

M14

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.9...2.4

100 s: (1.6...2.6)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 142.0...144.0

1000 : (139.0...147.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1245...1275



4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### TORQUE CONTROL

Dimension a mm : 0.25  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 700  
Rack travel in m: 15.60...15.80  
3rd speed rpm : 1000  
Rack travel in m: 14.60...14.80  
4th speed rpm : 860  
Rack travel in m: 15.20...15.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.60...15.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.90...13.10  
2nd pressure hPa : 575  
Rack travel in m: 15.00...15.10  
3rd pressure hPa : 310  
Rack travel in m: 13.60...13.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 116.0...118.0  
1000 s: (113.0...121.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...195.0  
1000 s: (171.0...199.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 19.0...24.0  
1000 s: (16.5...26.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 a1  
 Edition : 29.04.91  
 Replaces : 02.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 826  
 Injection pump  
 Pump designation : PE6P120A32ORS3178  
 EP type number : 0 411 826 752  
 Governor  
 Governor design. : RQV250...1025PA657-10  
 Governor no. : 0 421 813 567

Customer-spec. information  
 Customer : VOLVO

Engine : TD122FS

1st version kW : 287.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 25.2...25.4  
 100 s: (24.9...25.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 4.8...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.3  
 100 s: (1.5...2.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 250  
 travel mm : 1.00...1.40  
 2nd speed rpm : 450  
 travel mm : 3.60...4.20  
 3rd speed rpm : 800  
 travel mm : 6.30...6.70  
 4th speed rpm : 1070  
 travel mm : 8.00...8.20  
 5th speed rpm : 1150  
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1090  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 1200  
Del.quantity : 252.0...254.0  
1000 : (249.0...257.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 120  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 810  
Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del.quantity cm<sup>3</sup>/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 d  
 Edition : 29.11.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 900  
 Injection pump  
 Pump designation : PE6P120A32ORS3240  
 EP type number : 0 411 826 786  
 Governor  
 Governor design. : RQV250...1025PA921  
 -16  
 Governor no. : 0 421 813 799

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : TD122FL

1st version kW : 298.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 25.1...25.3

100 s: (24.8...25.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.40

2nd speed rpm : 450  
 travel mm : 3.60...4.20

3rd speed rpm : 800  
 travel mm : 6.30...6.70

4th speed rpm : 1070  
 travel mm : 8.00...8.20

5th speed rpm : 1150  
 travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 1200  
Del.quantity : 251.0...253.0  
1000 : (248.0...256.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 12.60  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.10  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 250...380

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 90  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 800  
Rack travel in m: 13.30...13.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 154.0...156.0  
1000 s: (151.0...159.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 k  
Edition : 29.11.91  
Replaces : 23.10.91  
Test oil : ISO-4113

Combination no. : 0 401 846 961

Injection pump  
Pump designation : PE6P120A320RS3292  
EP type number : 0 411 826 804  
Governor  
Governor design. : RQV300...1050PA1020  
Governor no. : 0 421 813 976

Customer-spec. information  
Customer : VME

Engine : TD122 GH 3049

1st version kW : 207.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 3.3...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.30...1.70

2nd speed rpm : 450  
travel mm : 2.40...3.00

3rd speed rpm : 700  
travel mm : 4.30...4.90

4th speed rpm : 1100  
travel mm : 7.80...8.00

5th speed rpm : 1200  
travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 205.0...207.0  
1000 : (202.0...210.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### PATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 88...96

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION  
Speed rpm : 300...420

TORQUE CONTROL  
Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 550  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 650  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.90...13.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.90  
2nd pressure hPa : 530  
Rack travel in m: 11.80...11.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 550  
Del.quantity cm3/ : 243.0...249.0  
1000 s: (240.0...252.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 208.0...210.0  
1000 s: (205.0...213.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...190.0  
1000 s: (156.0...194.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 33.0...38.0  
1000 s: (30.5...40.5)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 964  
  
Injection pump  
Pump designation : PE6P110A320RS3302  
EP type number : 0 411 816 181  
Governor  
Governor design. : RQ300/1000PA1012-1  
Governor no. : 0 421 801 648

Customer-spec. information  
Customer : DAF

Engine : LT 195 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.00...15.00

M22

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 3.90...4.10  
& maximum rack tra: 13.9...14.9  
Difference ° CS : 3.00...5.00

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 17.3...17.5

100 s: (17.0...17.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.6...2.1

100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 173.0...175.0

1000 : (170.5...177.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:



1st rack travel in: 13.40  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 330...370

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 1000  
Rack travel in m: 15.00...15.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.40...14.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 530  
Rack travel in m: 13.90...14.00  
3rd pressure hPa : 380  
Rack travel in m: 12.90...13.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.5...135.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1025...1040

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 16.5...21.5  
1000 s: (14.0...24.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MM 17,6 b1  
 Edition : 30.04.92  
 Replaces : 10.83  
 Test oil : ISO-4113

Combination no. : 0 401 870 070

Injection pump  
 Pump designation : PE12P110A520/5RS408  
 EP type number : 0 411 810 039  
 Governor  
 Governor design. : RSUV300...1150POA324  
 DR  
 Governor no. : 0 421 831 008

Customer spec. information  
 Customer : MM

Engine : D,DT,TBD232V12

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 12- 9- 4- 5- 8-  
 11- 2- 3- 10- 7- 6

Phasing : 0-30-60-90-120-150-  
 180-210-240-270-300-  
 330

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 13.6...13.9  
 100 s: (13.3...14.1)

Spread cm3 : 0.4  
 100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.2...7.4  
 Del.quantity cm3/ : 2.3...2.9  
 100 s: (2.0...3.1)

Spread cm3 : 0.4  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 136.0...139.0  
 1000 : (133.5...141.5)

Spread cm3 : 4.00  
 1000 : (7.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 57...65

Testing:  
 1st rack travel : 11.20  
 Speed rpm : 1190...1200

2nd rack travel in: 4.00  
 Speed rpm : 1235...1265

4th rack travel in: 1400  
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 17...25

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.8

Speed rpm : 300

Rack travel in mm : 6.70...6.90

Rack travel in mm : 2.00

Speed rpm : 320...380

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 1190...1200

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 401 876 791B  
Injection pump  
Pump designation : PE6P110A32OLS3859  
EP type number : 0 411 816 784  
Governor  
Governor design. : RSV400...900P1A554  
Governor no. : 0 421 833 376

Cust. part no. : 9273092

Customer-spec. information  
Customer : LIEBHERR

Engine : D 9306 TI

1st version kW : 230.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 3- 5- 2- 4

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del. quantity cm<sup>3</sup>/ : 19.5...19.7

100 s: (19.2...19.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 5.9...6.1  
Del. quantity cm<sup>3</sup>/ : 1.2...1.7  
100 s: (0.9...1.9)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1300  
Del. quantity : 195.0...197.0  
1000 : (192.5...199.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 96...102

Testing:

1st rack travel in: 13.50  
Speed rpm : 930...940  
2nd rack travel in: 4.00  
Speed rpm : 980...1020  
3rd rack travel in: 4.00  
Speed rpm : 1020...1040  
4th rack travel in: 1260  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...80  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.7  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 450...510

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : 1300  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 550

1st pressure hPa : -  
Rack travel in m: 13.70...13.80  
2nd pressure hPa : 710  
Rack travel in m: 14.00...14.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 177.5...179.5  
1000 s: (175.0...182.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 930...940

#### STARTING FUEL DELIVERY

Speed rpm : 100

M27

Del.quantity cm3/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 12.0...17.0  
1000 s: (9.5...19.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 7,7 b  
 Edition : 30.04.92  
 Replaces : 10.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 343  
 Injection pump  
 Pump designation : PES6P120A720RS3275  
 EP type number : 0 412 026 745  
 Governor  
 Governor design. : RQV300...1100PA954-1  
 K  
 Governor no. : 0 421 815 273

Customer spec. information  
 Customer : IVECO-UNIC

Engine : 8360.46.016

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 11.50...11.60  
 Del.quantity cm3/ : 18.3...18.5  
 100 s : (18.0...18.8)  
 Spread cm3 : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 4.2...4.6  
 Del.quantity cm3/ : 2.0...2.6  
 100 s : (1.7...2.9)  
 Spread cm3 : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.60...10.80  
 2nd speed rpm : 300  
 travel mm : 1.00...1.40  
 3rd speed rpm : 850  
 travel mm : 6.60...7.00  
 4th speed rpm : 1350  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1000  
 Del.quantity : 183.0...185.0  
 1000 : (180.0...188.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 115...123

Testing:

1st rack travel in: 10.10

Speed rpm : 1170...1180

2nd rack travel in: 4.00

Speed rpm : 1225...1255

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 73...81

Testing:

Speed rpm : 100

Minimum rack travel: 5.90

Speed rpm : 325

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

Speed rpm : 320...440

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 11.50...11.60

2nd speed rpm : 1100

Rack travel in m: 11.00...11.20

3rd speed rpm : 700

Rack travel in m: 10.90...11.10

4th speed rpm : 350

Rack travel in m: 9.00...9.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 900

Pressure hPa : 1000

Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.40...8.60

2nd pressure hPa : 550

Rack travel in m: 10.40...10.50

3rd pressure hPa : 320

Rack travel in m: 9.10...9.30

## START CUT-OUT

Speed 1/min : 275 (295)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1100

Del.quantity cm3/ : 170.0...176.0

1000 s: (167.0...179.0)

Aneroid pressure h: 1000

Speed rpm : 700

Del.quantity cm3/ : 164.0...170.0

1000 s: (161.0...173.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 95.0...97.0

1000 s: (92.0...100.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1170...1180

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 100.0...120.0

1000 s: (96.0...124.0)

## LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.20...4.60

Del.quantity cm3/ : 20.0...26.0

1000 s: (17.0...29.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y 1  
 Edition : 30.04.92  
 Replaces : 08.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 722  
 Injection pump  
 Pump designation : PES6P120A72GRS3205  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534  
 Governor no. : 0 421 833 275

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HF

1st version kW : 205.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 16.8...17.0

100 s: (16.6...17.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (1.8...2.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 168.0...170.0

1000 : (166.0...172.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:



1st rack travel in: 11.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1185...1195  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.70...4.90

TORQUE CONTROL  
Torque control curve -- 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 750  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 585  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 770  
Rack travel in m: 12.20...12.60  
3rd pressure hPa : 1200  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 174.5...178.5  
1000 s: (172.5...180.5)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm3/ : 117.5...121.5  
1000 s: (114.5...124.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (18.0...26.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:  
: JOHN DEERE # RE32035

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g  
Edition : 30.04.92  
Replaces : 11.90  
Test oil : ISO-4113

Combination no. : 0 402 076 730

Injection pump  
Pump designation : PES6P110A720RS3217  
EP type number : 0 412 016 724  
Governor  
Governor design. : RSV550...1050P2A534-3  
Governor no. : 0 421 833 304

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6619AT07

1st version kW : 205.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

NO4

Prestroke mm : 3.45...3.55  
: (3.40...3.60)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.10...12.20

Del. quantity cm<sup>3</sup>/ : 18.3...18.5

100 s : (18.1...18.8)

Spread cm<sup>3</sup> : 0.4

100 s : (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 5.2...5.4

Del. quantity cm<sup>3</sup>/ : 3.3...3.7

100 s : (3.1...3.9)

Spread cm<sup>3</sup> : 0.6

100 s : (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del. quantity : 183.5...185.5

1000 : (181.0...188.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 11.10  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
3rd rack travel in: 4.00  
Speed rpm : 1195...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 5.20...5.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.10...12.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 295  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 510  
Rack travel in m: 11.70...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 167.0...171.0  
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1095...1105

N05

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (175.0...205.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 33.0...37.0  
1000 s: (31.0...39.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE36078

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

APPLICATION

Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 076 745  
  
Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV625...1100P2A534-9  
Governor no. : 0 421 833 372

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kW : 205.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

NO6

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.2...17.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 625.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm<sup>3</sup>/ : 2.7...3.1  
100 s: (2.5...3.3)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200  
Del.quantity : 174.5...176.5  
1000 : (172.5...178.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 39...47

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 625  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 625  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 645  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 840  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 187.0...191.0  
1000 s: (185.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 800

NO7

Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 625  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 27.0...31.0  
1000 s: (25.0...33.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 22,0 c 2  
 Edition : 30.04.92  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 828  
 Injection pump  
 Pump designation : PE12P120A520LS7826  
 EP type number : 0 412 620 817  
 Governor  
 Governor design. : RQV350...1050PA870  
 -13  
 Governor no. : 0 421 813 934

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 620.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 3/5

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 27.4...27.6

100 s: (27.1...27.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 570  
 travel mm : 3.30...3.80

3rd speed rpm : 900  
 travel mm : 5.40...5.90

4th speed rpm : 1107  
 travel mm : 7.80...8.30

5th speed rpm : 1204  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1175

Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
 Aneroid pressure h: 1800  
 Del.quantity : 274.0...276.0  
 1000 : (271.0...279.0)  
 Spread cm3 : 6.00  
 1000 : (10.00)

## RATED SPEED

1st version

Control lever  
 position degrees: 114...122

Testing:

1st rack travel in: 13.00  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1170...1200  
 4th rack travel in: 1250  
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
 position degrees: 59...67

Testing:

Speed rpm : 250  
 Minimum rack travel: 7.30  
 Speed rpm : 350  
 Rack travel in mm : 5.30...5.90

## CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
 Compensator Test

1st version

Setting  
 Speed rpm : 500  
 Pressure hPa : -  
 Rack travel mm : 8.20...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
 Rack travel in m: 9.60...9.70  
 2nd pressure hPa : 1100  
 Rack travel in m: 13.80...14.10

## START CUT-OUT

Speed 1/min : 310 (330)

N09

# FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
 Speed rpm : 750  
 Del.quantity cm3/ : 271.0...275.0  
 1000 s: (268.0...278.0)  
 Spread cm3 : 10.00  
 1000 s: (15.0)  
 Aneroid pressure h: -  
 Speed rpm : 500  
 Del.quantity cm3/ : 124.0...126.0  
 1000 s: (121.0...129.0)  
 Spread cm3 : 10.00  
 1000 s: (15.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00  
 Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm3/ : 330.0...350.0  
 1000 s: (326.0...354.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 9,7 d  
 Edition : 30.04.92  
 Replaces : 09.86  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 830  
 Injection pump  
 Pump designation : PE6P120A72ORS7118  
 EP type number : 0 412 626 811  
 Governor  
 Governor design. : RG300/110CPA784  
 Governor no. : 0 421 801 337

Customer-spec. information  
 Customer : STEYR

Engine : WD615.68

1st version kW : 228.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 1.5...2.1

100 s: (-)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.70



Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 300  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 570  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 360  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 190.0...196.0  
1000 s: (187.0...199.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 225.0...265.0  
1000 s: (-)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 9,7 d 1  
 Edition : 30.04.92  
 Replaces : 09.86  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 831  
 Injection pump  
 Pump designation : PE6P120A720RS7118  
 EP type number : 0 412 626 811  
 Governor  
 Governor design. : RQV250...1100PA785  
 Governor no. : 0 421 813 517

Customer-spec. information  
 Customer : STEYR

Engine : WD615.68

1st version kW : 228.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.5...2.1

100 s: (-)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.20...1.30

2nd speed rpm : 350  
 travel mm : 1.80...2.20

3rd speed rpm : 410  
 travel mm : 2.30...2.70

4th speed rpm : 1150  
 travel mm : 8.40...8.60

5th speed rpm : 1240  
 travel mm : 9.50...9.80

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 181.0...183.0  
1000 : (178.0...186.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 250  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 275...375

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.70...12.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 570  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 360  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 170 (195)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

N13

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 190.0...196.0  
1000 s: (187.0...199.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 225.0...265.0  
1000 s: (221.0...269.0)  
Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 r  
Edition : 30.04.92  
Replaces : 05.91  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 887  
  
Injection pump  
Pump designation : PE6P120A72DRS7188  
EP type number : 0 412 626 832  
Governor  
Governor design. : RQV200...950PA725-7  
Governor no. : 0 421 813 803

Customer-spec. information  
Customer : SCANIA

Engine : DSC 11 23

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 104  
  
Opening  
pressure, bar : 250...253  
  
Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 4.40...4.50  
                  : (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
  
Rack travel in mm : 13.80...13.90  
  
Del.quantity cm3/ : 25.1...25.3  
100 s: (24.8...25.6)  
  
Spread cm3 : 0.8  
100 s: (1.2)

2nd speed rpm : 250.0  
Rack travel in mm : 4.6...5.0  
Del.quantity cm3/ : 1.4...2.0  
100 s: (-)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60  
2nd speed rpm : 350  
travel mm : 2.40...3.00  
3rd speed rpm : 650  
travel mm : 4.50...5.10  
4th speed rpm : 1045  
travel mm : 8.40...8.60  
5th speed rpm : 1125  
travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1150  
Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1500  
Del.quantity : 251.0...253.0  
1000 : (248.0...256.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 125  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 440  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 270  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm3/ : 228.0...236.0  
1000 s: (226.0...238.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 152.0...154.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (-)  
Rack travel in mm : 10.20...10.60

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,1 c  
Edition : 30.04.92  
Replaces : 01.92  
Test oil : ISO-4113

Combination no. : 0 402 646 921

Injection pump  
Pump designation : PE6P120A32CLS7837-10  
EP type number : 0 412 626 855  
Governor  
Governor design. : RQ300/1050PA972-3  
Governor no. : 0 421 801 565

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.60...6.20  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 600  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1250  
Rack travel in m: 14.80...15.00 \*  
4th pressure hPa : 1400  
Rack travel in m: 15.20...15.40  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800  
Speed rpm : 1050

Del.quantity cm3/ : 235.0...238.0  
1000 s: (232.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...90.0  
1000 s: (56.0...94.0)  
Rack travel in mm : 9.10...9.40

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 13,8 h2  
 Edition : 29.11.91  
 Replaces : 8.10.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 947

Injection pump  
 Pump designation : PE6P130A72ORS7225  
 EP type number : 0 412 636 817  
 Governor  
 Governor design. : RQV300...950PA1002  
 -1K  
 Governor no. : 0 421 815 280

Customer spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 13.50...14.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 30.6...30.9  
 100 s: (30.2...31.2)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.2  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (1.5...2.9)

Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
 travel mm : 8.50...8.70

2nd speed rpm : 300  
 travel mm : 1.00...1.40

3rd speed rpm : 500  
 travel mm : 3.30...3.90

4th speed rpm : 750  
 travel mm : 5.80...6.20

5th speed rpm : 1300  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 950  
 Aneroid pressure h: 900  
 Del.quantity : 306.0...309.0  
 1000 : (302.5...312.5)



Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 340...460

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 750  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 500  
Rack travel in m: 12.50...12.70  
4th speed rpm : 300  
Rack travel in m: 12.10...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 560  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 350

Rack travel in m: 10.80...11.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 273.0...279.0  
1000 s: (266.5...282.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 195.0...198.0  
1000 s: (191.5...201.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...170.0  
1000 s: (136.0...174.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 976  
  
Injection pump  
Pump designation : PE6P120A320LS7846  
EP type number : 0 412 626 865  
Governor  
Governor design. : RQ300/1050PA1031  
Governor no. : 0 421 801 642

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.70...13.90

Del.quantity cm3/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : -

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10  
Rack travel in mm : 2.00  
Speed rpm : 400...440

TORQUE CONTROL

Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 850  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 700  
Pressure hPa : -  
Rack travel mm : 10.80...11.00

Measurement

Speed 1/min : 700  
1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 700  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
1000 s: (213.0...223.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1105

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 978  
  
Injection pump  
Pump designation : PE6P120A320LS7846  
EP type number : 0 412 626 865  
Governor  
Governor design. : RQ300/950PA1031-1  
Governor no. : 0 421 801 643

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.70...13.90

Del.quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : ?

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10  
Rack travel in mm : 2.00  
Speed rpm : 390...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 700  
Pressure hPa : -  
Rack travel mm : 10.80...11.00

Measurement  
Speed 1/min : 700

1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 700  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm3/ : 226.0...230.0  
1000 s: (223.0...233.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

N23

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 990...1005

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 5,8 D  
Edition : 30.04.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 403 444 119

Injection pump  
Pump designation : PES4MW100/320RS1199  
EP type number : 0 413 404 112  
Governor  
Governor design. : RQV300...1300MW110K  
Governor no. : 0 420 083 996

Customer-spec. information  
Customer : PERKINS

Engine : 110 TI

1st version kW : 82.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)  
Rack travel in mm : 12.00...14.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 10.00...10.40

2nd speed rpm : 900  
travel mm : 6.40...6.60

3rd speed rpm : 480  
travel mm : 3.10...3.70

4th speed rpm : 300  
travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 124.0...126.0

1000 : (122.0...128.0)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 12.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 330...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 800  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 500  
Rack travel in m: 10.30...10.50  
4th speed rpm : 1000  
Rack travel in m: 12.40...12.70  
5th speed rpm : 400  
Rack travel in m: 9.90...10.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

#### Measurement

Speed 1/min : 1300

1st pressure hPa : 130

N25

Rack travel in m: 9.80...9.90  
2nd pressure hPa : 180  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 13.00...13.10

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 118.0...121.0  
1000 s: (115.5...123.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...90.0  
1000 s: (77.0...93.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 8,1 D  
Edition : 18.09.91  
Replaces : 06.91  
Test oil : ISO-4113

Combination no. : 0 403 446 249

Injection pump  
Pump designation : PES6MW100/720RS1197  
EP type number : 0 413 406 185  
Governor  
Governor design. : PQV325...1350MW109K  
Governor no. : 0 420 083 997

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8060.45.6000

1st version kw : 169.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300 .

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 7.7...7.9

Del.quantity cm<sup>3</sup>/ : 2.5...2.9

100 s: (2.2...3.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
travel mm : 10.00...10.40

2nd speed rpm : 825  
travel mm : 4.90...5.10

3rd speed rpm : 400  
travel mm : 2.90...3.50

4th speed rpm : 325  
travel mm : 1.50...1.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 850

Del.quantity : 100.0...102.0

1000 : (98.0...104.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 117...125



Testing:

1st rack travel in: 13.00  
Speed rpm : 1410...1420  
2nd rack travel in: 4.00  
Speed rpm : 1515...1545  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.8

Testing:

Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 325  
Rack travel in mm : 7.70...7.90

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1200  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 1000  
Rack travel in m: 13.20...13.50  
4th speed rpm : 700  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.20...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 850  
Rack travel in m: 13.30...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 850  
Speed rpm : 1200

Del.quantity cm3/ : 100.0...103.0  
1000 s: (97.5...105.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 850  
Speed rpm : 1000  
Del.quantity cm3/ : 100.5...103.5  
1000 s: (98.0...106.0)  
Aneroid pressure h: 850  
Speed rpm : 700  
Del.quantity cm3/ : 101.5...104.5  
1000 s: (99.0...107.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.5...79.5  
1000 s: (75.5...81.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1410...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 65.0...85.0  
1000 s: (62.0...88.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.70...7.90  
Del.quantity cm3/ : 25.0...29.0  
1000 s: (22.5...31.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: